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Slovak University of Agriculture in Nitra

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Foreword

Dear colleagues and friends,

At this very moment you are opening the book of abstracts from the international scientific conference International Scientific Days 2016 organized under the theme: "The Agri-Food Value Chain: Challenges for Natural Resources Management and Society" by the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra, Slovak Republic. This conference with 274 participants from 23 countries is very good starting point for presenting new ideas or critical statements, sharing information and for establishing cooperation. International Scientific Days 2016 provides a venue for policy makers, top managers, academics and researches that deal with economic and management issues related to specific issues within the agri-food chains and natural resources management.

Broad changes are taking place in food and agricultural sector worldwide. In connection to the new EU countries the accession led to the number of changes with significant impact on performance and role of this sector. The global financial crisis and the accompanying slowdown of the economy reversed to the increased commodity prices which strongly impacted the food security and poverty of net food consumers. While the farmers could benefit from the higher commodity prices, at the same time, a reduction in real term wages, decreased employment which have negatively affected the income of households in the region and increased poverty. Diversification of activities on the income generation activities in the market economy conditions is the key factor for the economic survival of farms. The important challenge is also to achieve balanced and sustainable growth of rural economies.

International Scientific Days 2016 provide the platform for dissemination of activities and outcomes of the two international project coordinating by the Faculty of Economics and Management SUA Nitra: TEMPUS project "Development of Public Accreditation of Agricultural programs in Russia (PACAgro) 2013-2016" (Project No. 543902-TEMPUS-1-2013-SK-TEMPUS-SMGR, co-funded by the Tempus Programme of the European Union) and Strategic partnership project "Food Quality and Consumer Studies (FOODCOST) 2014 - 2017" (Project No. 2014-1-SK01-KA203-000464, co-funded by the Erasmus+ Programme of the European Union within the Strategic Partnership frame).

I would like to take this opportunity to thanks all policy makers, academics, researchers, mangers and sponsors which accepted our invitation and became active member of the conference. My special thank belongs all of the people who made this conference successful and valuable experience for each and every one of us.

Elena Horská

Dean

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PLENARY SESSION

The agri-food value chain: Challenges for natural resources management and society

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Economic aspects of the EU agricultural sector: New challenges both at home and away

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Abstract
The Common Agriculture Policy has been modified for the period 2014-2020. The main change relates to environmental protection, more market orientation, ensuring rural development and quality of food. Within the given period the agriculture sector faces new internal and external challenges and will also encounter opportunities. The paper analyses both internal and external factors ahead. Among the internal factors, it encounters issues such as market situation, especially in the dairy and sugar sectors in relation to the end of the quota regime, simplification of rules for farmers and public authorities, competiveness, rural development, job creation, functioning of the food chain and the situation of young farmers. Among external factors the paper deals with trade agreements under negotiation, the link between agriculture and climate and global food security.

Key words: *CAP, market support, regulatory simplification, greening, trade relations, climate change*

JEL Classification: *Q18, P42*

1. Introduction

The Common Agricultural Policy (CAP) belongs to most mature policies of the EU. Since its introduction in the beginning of the 60s, it has been one of the major achievements of the European integration. It has been successful for having provided the European Union with constant food supply, stability in prices, development of the rural areas and fairer life conditions for farmers. The CAP undertook fast pace changes recently experienced by European Union, such as the EU enlargement, new international agreements or market disruptions. Therefore, several reforms have been carried out in order to face the new challenges but, the CAP has proven to be an especially resilient, hard-to-modify policy.

The CAP is managed, and funded from the resources of the EU annual budget, of which the CAP constitutes almost 40% of the total budget. Its objective is manifold: to provide food security, to face global competition, economic and financial crises, climate change and to ensure sustainable management of the natural resources or food security, amongst others.

In 2013, the CAP has faced its last reform. This reform is composed of four regulations which cover issues such as Direct Payment, Market Management mechanisms or Rural Development, amongst others. This reform aims at strengthening the economic basis of the CAP and addressing the environmental and social aspects of farming. The EU has thus reinforced its agricultural position in order to face new challenges ahead, both at internal and at external level. This paper will analyse which are these challenges, what the EU has done in order to confront them and what is the outcome so-far.

The objective of this article is to analyse both internal and external factors ahead which are influencing the CAP. Among the internal factors, it encounters issues like market situation, especially in the diary and sugar sectors in relation to the end of the quota regime - but, also in other sectors like pig meat, simplification of rules for farmers and public authorities, competiveness, rural development, job creation, functioning of the food chain and the situation

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of young farmers. Among the external factors the paper deals with trade agreements under negotiation, the link between agriculture and climate and food security globally.

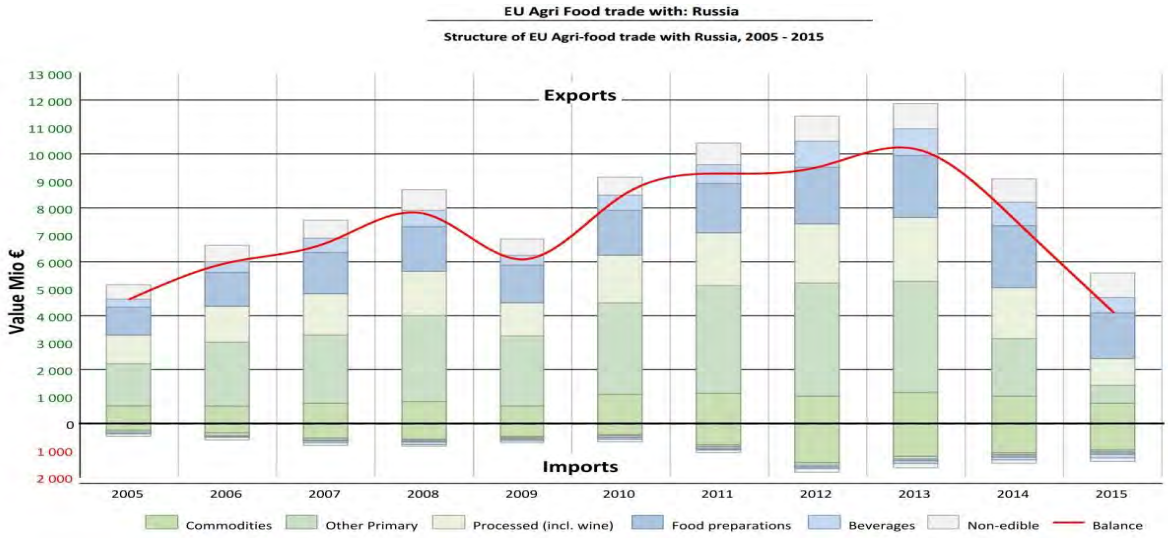
2. Internal challenges of the EU farming sector

The EU is facing numerous challenges in the agriculture sector at an internal level. These challenges have a wide scope, it could not be otherwise when dealing with a transversal topic such as agriculture. Below is the non-exhaustive list of internal challenges facing the CAP.

a) The Russian Embargo

Following the Ukraine conflict, and subsequent to the economic sanctions imposed by the EU, the Russian Federation in August 2014 decided to prohibit the importation of food and agricultural products from the EU for a year. In July 2015, the Russian Federation announced the extension of the import embargo by another year (until August 2016).The affected categories are beef, pork and poultry meat, dairy products, fruits and vegetables. The Russian Federation was the second biggest destination of EU agri-food products: 12% of exports in the fruit and vegetable sector and 10% of dairy exports previously went to Russia. This situation has been specially hard for the pig meat sector, which already suffered an embargo following an African swine fever outbreak in the east of the EU.

Figure 1: EU-Russian Federation trade relations (2005 - 2015)



Source: DG Agriculture and Rural Development

Right after the announcement of the embargo, the European Commission (EC) adopted under the urgency procedure different measures, extended and reinforced because of the prorogation of the import ban. They were aimed at helping the most affected sectors, and included, among others: support for producers of certain fruits and vegetables; extension of the public intervention period for butter and skimmed milk powder; an exceptional private storage aid scheme for certain cheeses, butter and skimmed milk powder; and compensation for producers in the dairy sector in the most affected Member States (MS). In order to implement these measures, the EC has allocated an aid package of more than 500M€.

The EU has also increased the exports to third countries in order to curb the effects of the embargo. According to DG Agriculture and Rural Development (2016), over the 12 month of the Russian ban being in force (August 2014-July 2015), total EU agri-food exports to third countries increased in value by 5.7% compared to one year ago. After a very positive performance during the first half of the year 2015, with a record month in March (at almost €12

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billion), the second half of the year has also started off with a positive trend: July 2015 exports recorded +8% compared to July 2014.

It still remains to be seen how much longer the EU can continue these measures if the Russian market keeps closed. What is clear is that this enhanced emergency mechanism, introduced in the 2013 reform, has proven to be efficient in terms of support to producers and price stability, at least for now. However, the ban has lead to a reallocation of agricultural products into the internal market and abroad, which has turned out to be one of the main factors of the farming sector crisis characterized by market imbalances and low prices.

b) Market Support

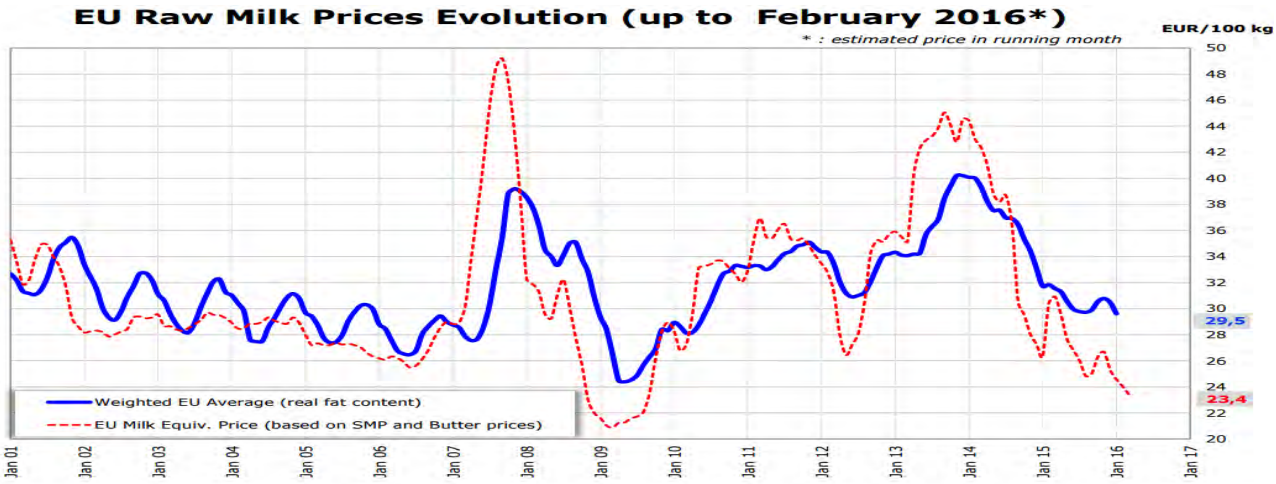
Since summer 2015, the dairy, pig meat and other sectors have suffered difficulties mainly due to excess supply worldwide and the Russian ban.

Dairy sector

In the dairy sector, one of the key issues has been the lifting of milk quotas. After more than 30 years, milk quotas were abolished in 2015. They were established in 1984 when the European Union (European Economic Community back then) faced a huge overproduction of milk which led to what at the time was known as "milk lakes and butter mountains". The EU created the quota system in order to control the production and bring stability to the markets. If producers exceeded the quota they had to pay a levy. In 2009, the CAP reform, known as Health Check, laid down the end of these quotas with the objective of turning the milk sector more market oriented and to meet the increasing world demand for milk.

In order to help the smooth transition to a new situation, a "soft landing" with an increase of 1% in quotas during 5 years was foreseen. The EC also created the Milk Market Observatory, where farmers can follow the evolution of the dairy market and adapt their investments and production. The end of the quotas was made effective in April 2015 but, it has come together with one of the most severe crisis ever in the sector. With the new system without quotas, which is more market based, farmers have to cope with the market trends in order to adjust their production and have to face the volatility of prices for the first time. For instance, prices were high in 2013-2014, which boosted production, but dramatically dropped in 2015 due to the Russian ban, an excess of supply and the decrease of world demand. Moreover, the removal of ceilings has boosted milk production which has contributed to an excess of dairy products supply in the EU and in the world.

Figure 2: EU raw milk prices development (2001-2016)



Source: Milk Market Observatory

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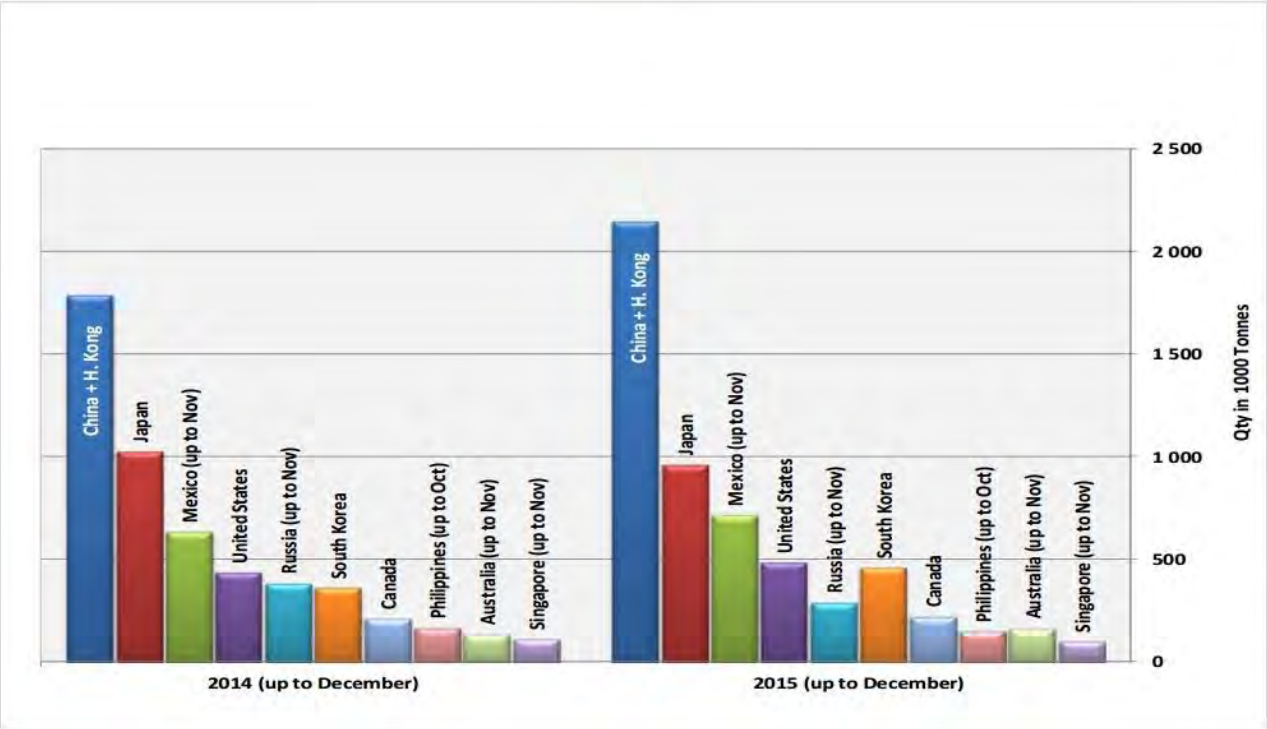
In order to help the farmers' cash-flow difficulties, and stabilize both markets and the supply chain, the EU adopted in 2015 a 500€ million aid package which includes 420€ million for temporary exceptional aid to farmers in the livestock sector, private storage aid for cheese, improved private storage aid scheme for skimmed milk powder, increased rate of advances of the CAP direct payments, certain rural development measures, increase in EU funding for promotion under the 2016 Annual Work Programme, and humanitarian assistance. These measures were reinforced in 2016 by new measures, which included, amongst others, the application of a voluntary supply management, a temporary increase of state aid, an increase of intervention ceilings for SMP and butter, a strengthening of producers in the supply chain, the participation of the European Investment Bank (EIB) to ease new financial instruments and the increase of promotion in third countries. As a follow-up, the dairy sector development will stay under close scrutiny and more structural measures are underway, such as: improving farmer's position in the food chain and a proactive export policy.

Pig meat sector

Regarding the pig meat sector, the crisis it is facing is mainly due to two factors which are linked: excess of supply and the sanitary ban from Russia following an outbreak of African Swine Fever (ASF) in Lithuania, Poland, Estonia and Latvia in 2014. This sanitary ban is different from the embargo as the second does not include edible offal nor bacon from pig meat. However, the sanitary ban prevent products from the entire EU being commercialized in Russia.

Figure 3: Main importers of pig products 2016 (excluding live animals)



Source: DG Agriculture and Rural Development

The result, as for dairy products, is that pig meat products that were once destined for Russia now have to be absorbed by the internal market and abroad. The outcome has been a reduction of prices due to oversupply, causing a price crisis in the sector. The EU launched a case against the Russian ban in the World Trade Organization (WTO) claiming that the sanitary ban is disproportionate, discriminatory and not based on scientific evidence. A ruling from the WTO is expected in 2016.

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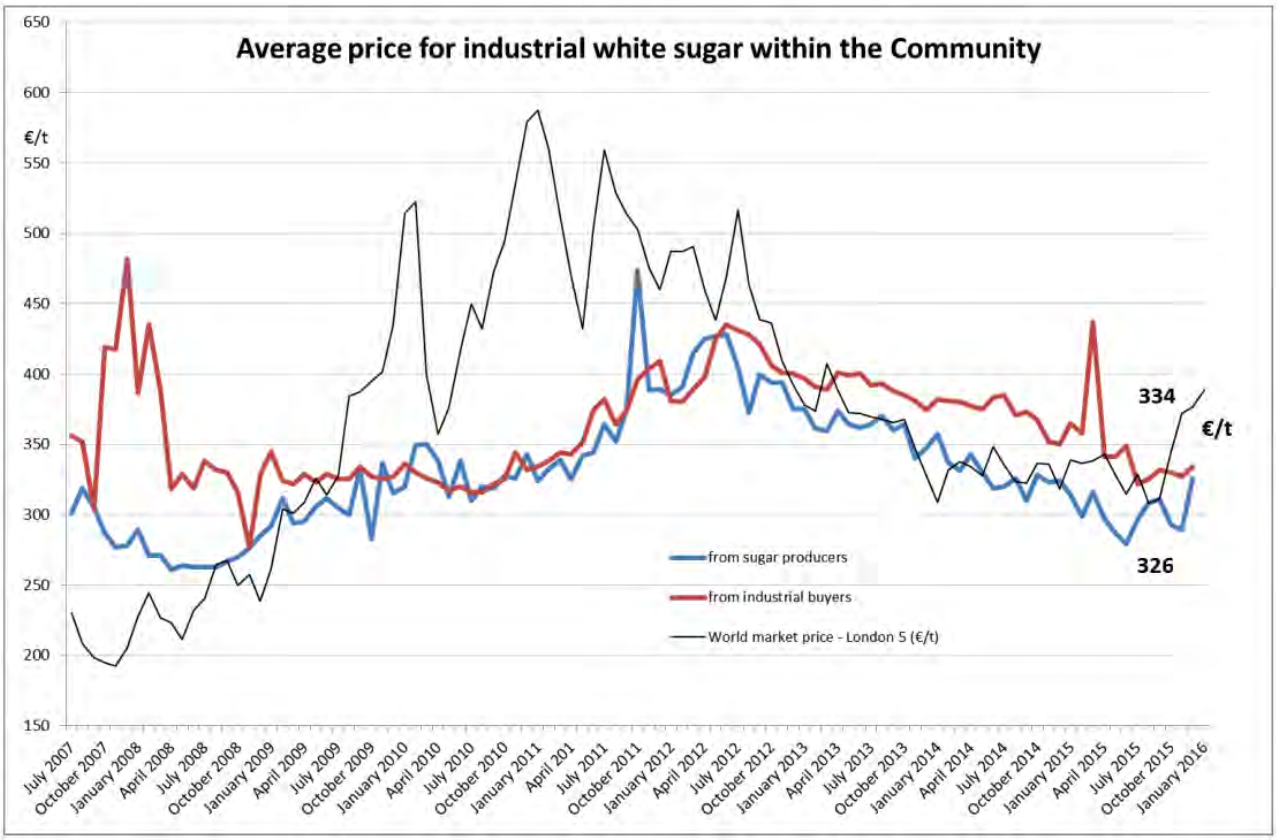
In the meantime, the EU has to face the crisis in the sector. Apart from sanitary and control measures, the EU has set up a series of actions in order to support the pig meat sector, such as aid for private storage and the creation of a Meat Market Observatory.

Sugar sector

Since 1968 the EU sugar policy uses a quota system. This policy concerns three main areas: quota management, a reference price and a minimum guaranteed price to growers, and trade measures. In 2006, the WTO questioned this system and the EU decided upon the removal of quotas, first foreseen for 2015 and finally postponed until October 2017.

The EU is the world's biggest producer of beet sugar (around 50% of the total world's production, which is made of 20% beet sugar and 80% cane sugar) and the principal importer of raw cane sugar for refining. Sugar quotas account for 13.5 million tonnes divided between 19 Member States. From 2017, the sugar sector will have to operate on its own and its production will be marked by market conditions. The economical effect of this decision is expected to bring the EU sugar sector to be more globally competitive.

Figure 4: Price development of the white sugar within the EU



Source: DG Agriculture and Rural Development

World sugar prices have recorded a downward trend in the last four years, with a sharp decline in the first half of 2015. This is mainly due to: ample supplies in major sugar producing countries, including Brazil, the world's largest producer and exporter, and falling crude oil prices that have reduced the volume of sugar crops being converted into ethanol. According to the medium term review from the EC (2015) sugar beet and white sugar production are expected to increase slightly after quota expiry due to consistently high yield increases, low transportation costs and the reduced costs of longer production and processing campaigns.

In summary on market situation, the EU is providing the farming sector with a temporary and a long term assistance. Apart from these measures targeted at specific sectors, the 2013 CAP reform has introduced a reserve for crises of €2.8 billion (€400 million per year), outside the multiannual financial framework (MFF). This reserve could be used by the Commission as market support measures in response to market disruption related to animal diseases and/or loss of consumer confidence due to animal or plant health issues (Olper, A. and Pacca, L., 2015). These aids will help to address short-term problems, but if the market difficulties persist then longer term measures will be needed. This reserve would be used as a last resort measure.

c) Simplification of the CAP

Although the last reform of the CAP was agreed in 2013 and came into force in 2014, the EC, the European Parliament (EP) and the Council have been discussing about its simplification. This exercise is focused on assessing where the greatest reduction in the administrative burden can be achieved, preserving the current policy framework and ensuring the sound financial management of the CAP. Simplifying the CAP is essential to making EU agricultural economy more competitive, preserving and creating jobs and contributing to a sound development of our rural areas.

These efforts to simplify CAP are not new. Many previous efforts have been made to simplify the CAP, yet the consensus seems to be that the policy has become even more complicated over time (Matthews, 2015). For years, different measures have been taken in order to achieve this objective. For instance, in 2007, a single Common Market Organization (CMO) replaced the previously existing 21 CMOs; in 2009, the CAP reform known as "Health Check", further decoupled and abolished several schemes. For imports, license requirements were reduced from 500 to 65 and for exports, only 43 license requirements remain; specific marketing standards for 26 types of fruit and vegetables were repealed, meaning operators no longer face compliance costs, national authorities no longer need to carry out controls; farmers are no longer required to keep land at their disposal for 10 months to receive direct payments, thus gaining greater flexibility in their farm management and in responding to market developments.

The AGRIFISH Council in May 2015 concluded to further simplify Direct Payments, Common Market Organization (CMO) Rural Development and Horizontal previsions.

d) Greening of the CAP

Climate change along with green growth/greening has become a key element for preserving the CAP (Erjavec, K. and Erjavec, E., 2015). The greening concept has been introduced with the 2013 reform and it makes the direct payments system more environment-friendly. The introduction of a ‘green’ component in the direct payments represents the first explicit attempt to link part of them to the remuneration of public goods and services produced by the farm, a goal advocated by many in the debate preceding the start of the reform process (Ania, G. and Pupo, M. R., 2015).

The Single Payment Scheme has been replaced by the Basic Payment Scheme (BPS). Eligibility for this BPS is a precondition for farmers to receive other direct payments such as the Green Direct Payment. In order to benefit from the BPS, farmers must have holdings that are at least 0.3 hectare and used for agriculture activity, and must also meet cross-compliance standards: environment, food safety and animal health and welfare laws.

Green direct payments account for 30% of EU countries' direct payment budgets. In order to have access to these payments, farmers should implement a series of measures in their farms, namely diversifying crops, maintaining permanent grassland, dedicating 5% of arable land to

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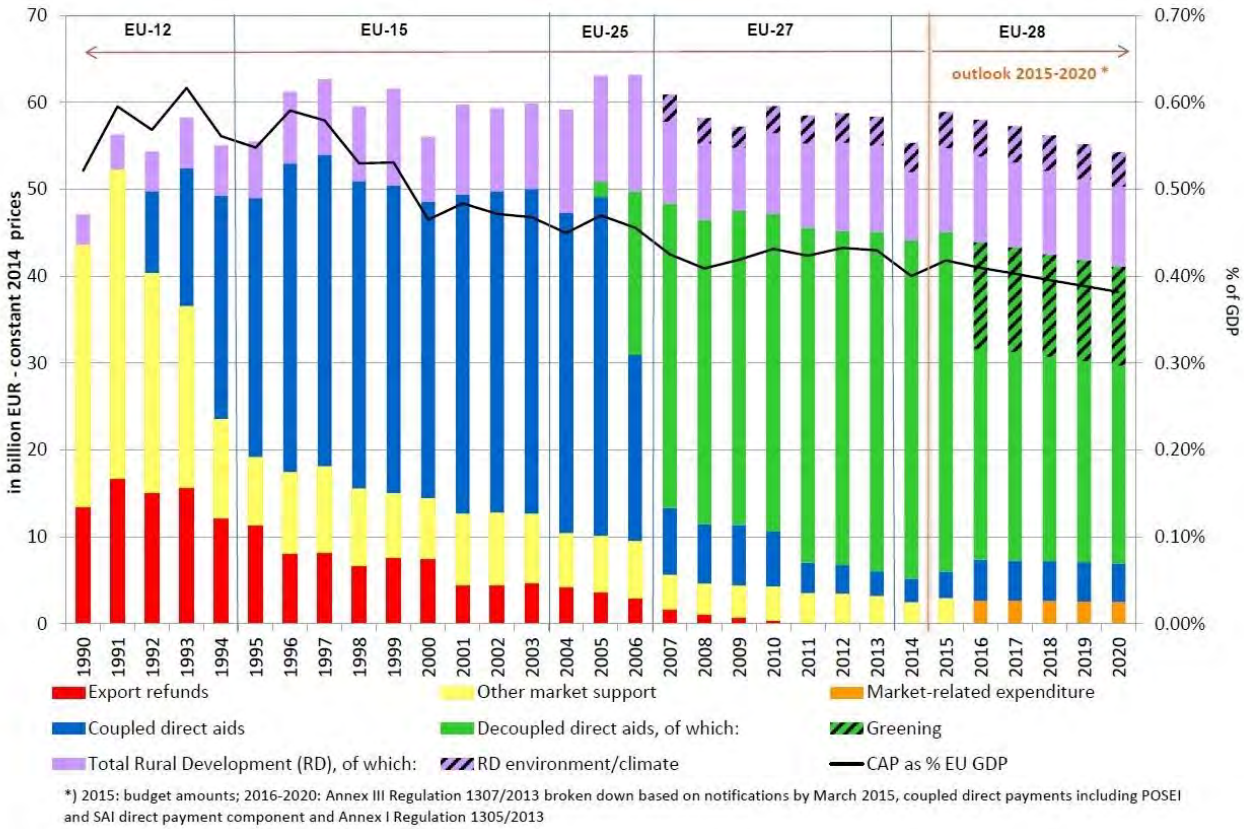
'ecologically beneficial elements' ('ecological focus areas'). CAP has thus shifted from market support to promoting sustainable development (Dragoi, A. Balgar, C., 2015).

Figure 5: CAP budgetary allocations (1990-2020)



Source: DG Agriculture and Rural Development

Under the current CAP, farmers receiving payments help conserve the environment and contribute to addressing greenhouse emissions by making soil and ecosystems more resilient, growing a greater variety of crops, conserving soil carbon grassland habitats associated with permanent grassland, protecting water and habitats, and establishing ecological focus areas.

Currently, the EC is carrying out a public consultation on the greening measures introduced in the last 2013 Reform. At the time of the reform, it was agreed that the Commission should review the rules about the Ecological Focus Area after the first year of application looking in particular at the administrative burden, simplification potential, level playing field and aspects of production potential. The consultation is open until March 2016. Results should help to assess the effectiveness of these measures.

3 International challenges ahead

Apart from the internal challenges depicted above, the EU has to deal with different international issues. As an open economy, the EU has different agreements, commitments, treaties, etc., signed with different countries and organizations.

a) Free Trade Agreements

Among the different free trade agreements (FTA) under negotiation two are very sensitive: TTIP and Mercosur. These two agreements are, in terms of size and impact for agriculture, a major challenge for the EU farm sector.

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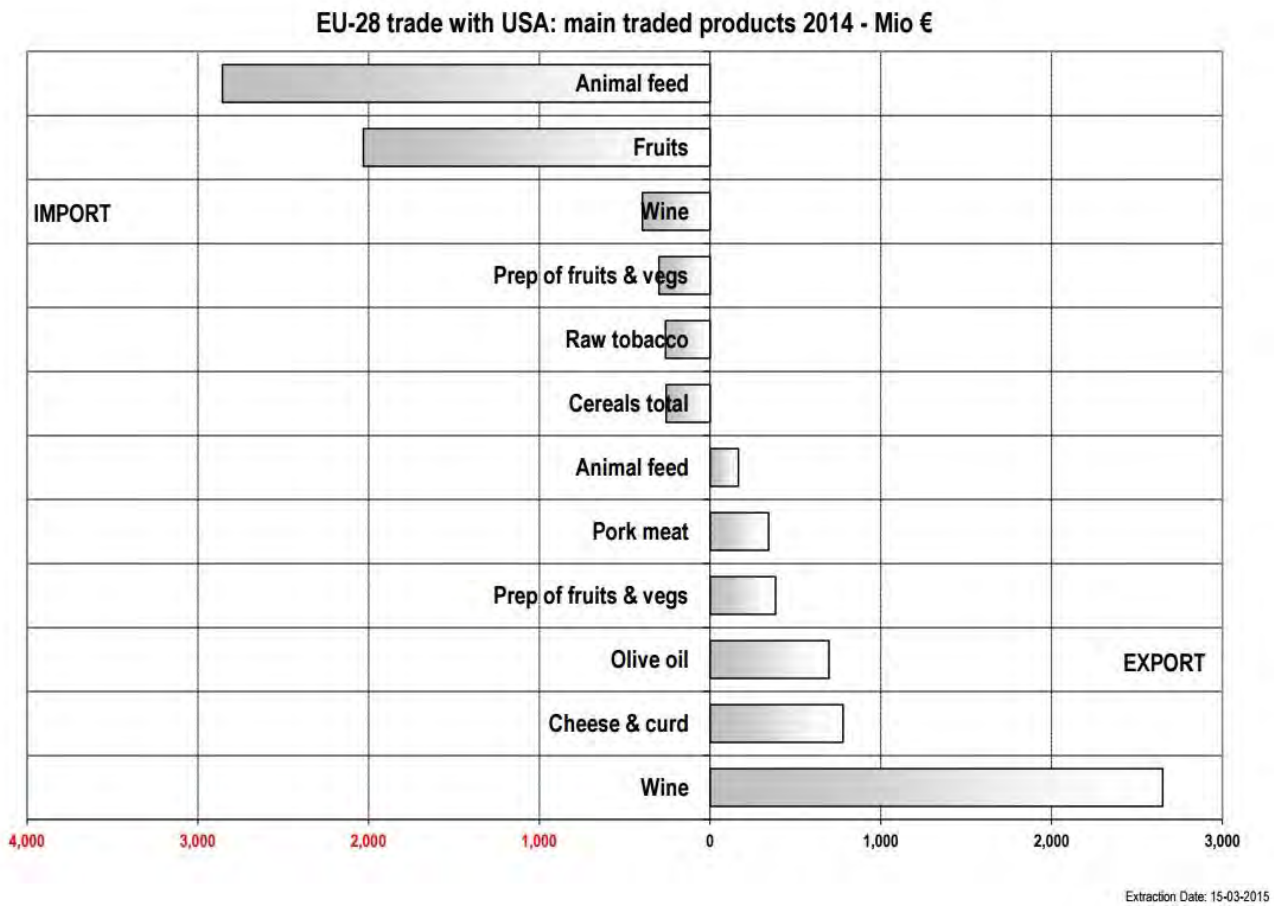
TTIP

The Transatlantic Trade and Investment Partnership (TTIP), is a free trade agreement between the United States (US) and the European Union. Its objective is to create the largest free trade area of the world and to boost jobs and growth in both regions.

This FTA has gained some popularity during the last years and has polarized the public opinion between those who support it and those who oppose it. In terms of agriculture, its impact could be enormous in different sectors such as beef, dairy products, geographical indicators (GIs), public procurement and others.

Figure 6: EU-US agricultural trade (2014, mio Euro)



Source: DG Agriculture and Rural Development

The EC has put the protection of the EU standards, such as the sanitary and phytosanitary (PSP) ones, high on the negotiation priorities. Fabri, E. (2015) states that tariff reduction is not the main topic on the table because tariffs between the EU and the US are already very low. The crucial point in negotiation are the Technical Barriers to Trade (TBT) and SPS measures. The TBT are established by the countries outlining the technical parameters that products should have. When requirements are different between two countries it could be considered as a barrier because one product has to be checked in both countries. SPS measures promote safety and animal and plant health. In this case the problem is that the EU has a different approach than that of the US. The EU follows the precautionary principle whilst in the case of the US, they rely on 'scientific evidences'.

In case an agreement is finally achieved, the overall ambition of the TTIP is to bring employment, growth and new market opportunities.

b) Mercosur

Other crucial FTA, that the EU is negotiating, is the one with Mercosur. Mercosur comprises Argentina, Brazil, Paraguay, Uruguay and Venezuela and its purpose is to promote free trade and the fluid movement of goods, people, and currency among its members. According to the EC the objective of this agreement is to negotiate a comprehensive trade agreement, covering not only trade in industrial and agricultural goods but also services and establishment and government procurement, and the improvement of rules inter alia on government procurement, intellectual property, customs and trade facilitation, technical barriers to trade.

However, there are several concerns about the impact of this agreement on the agriculture sector. Mercosur is composed of major players in agricultural production. Mercosur's biggest exports to the EU are made of agricultural products (DG Trade website) and it is likely that this FTA would increase this number. Moreover, an impact assessment from Kirpatrick, C. and George, C. (2006) shows that Mercosur is a very competitive market in the agricultural sector. Therefore, the EU should address its defensive as well as offensive interests in this area

c) WTO

The WTO has been the main forum for trade negotiations for last decades. Since its creation in the 90s (and before the GATT), it has welcomed the main multilateral negotiations on trade. The last round of negotiation, the Doha Development Round (DDR), which started in 2001 is the current one.

The subjects negotiated in the DDR are agriculture, non-agriculture market access (NAMA), services, trade facilitation, rules, environment, GIs, intellectual property or dispute settlement. On agriculture, negotiations are aimed more at market access, eliminating export subsidies, reducing distortion of domestic support, sorting out a range of developing country issues, and dealing with non-trade concerns such as food security and rural development. Negotiations are divided in three different pillars: trade facilitation, agriculture and development.

The DDR has suffered numerous setbacks. Disagreements on some issues between members and the single undertaking principle (nothing is agreed until everything is agreed) have hindered the negotiations. Moreover, with the limited progress in the WTO Doha Round the focus has turned to bilateral or regional trade agreements for expanding markets (Josling, T., 2015). However, during the 10th Ministerial Conference, held Nairobi in 2015, parties agreed on a global trade deal that benefits developing countries by getting rid of trade distorting export subsides in agriculture. This agreement is likely to benefit EU producers who will see for the first time a level playing field in export competition.

Although the DDR has accomplished many achievements, the difficulty to reach agreements in a multilateral system is fostering the appearance of many bilateral agreements, such as TTIP, Trans-pacific Partnership (TTP), or the Comprehensive Economic and Trade Agreement (CETA).

Agriculture will still be one of the major issues to be discussed in order to meet the Doha Development Agenda. The last Nairobi agreement shows that decisions made in this forum have an immediate and direct impact in the EU farming sector. The EU main challenge will be to combine liberalization, development and climate measures without jeopardizing the EU agriculture.

4 Policy discussions at global level: G20

The G20 is a forum which gathers the major 20 economies of the world. It was founded in 1999 with the aim of studying, reviewing, and promoting high-level discussion of policy issues pertaining to the promotion of international financial stability. Since 2009, it replaced the G8 as the main economic council of wealthy nations.

In terms of agriculture, the G20 Agriculture Ministers agreed at the Cannes G20 Summit in November 2011 on an "Action Plan on Food Price Volatility and Agriculture". This plan contains a broad scope of actions aimed at tackling price volatility from different angles, particularly through increasing agricultural production and productivity on a sustainable basis; enhancing market information and transparency; improving international policy coordination; better managing risks associated with excessive price volatility; and improving regulation and supervision of agricultural financial markets.

In the May 2015 G20 Agriculture Ministers meeting held in Istanbul, the Ministers agreed to set up a platform on food loss and waste, to strengthen the UN-FAO Agriculture Market Information System, and to define an Action Plan on Food Security and Sustainable Food Systems. The Action Plan identified three priority actions for the next three years: increasing responsible investment as well as incomes and quality employment in food systems, and increasing productivity sustainably to expand food supply.

The EU plays an important role in the G20. It could be an important arena where it can find allies, build commitments and put forward policies in order to improve its bargaining position in the WTO meetings.

d) Climate Change and Environment

At the Paris climate Conference of the Parties (COP21) in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal. This agreement is focused on Mitigation, Transparency and Global Stocktake, adaptation, Loss and Damage and Support. Its main objective is aimed at keeping the rise in temperature below 2°C. The agreement even establishes, for the first time, that we should be aiming for 1.5°C, to protect island states, which are the most threatened by the rise in sea levels (COP21 Website).

In terms of agriculture, the EU is aware that agriculture is one of the most susceptible sectors because of its dependence to weather. Variations in weather could severely modify the agricultural production and put at risk food sovereignty. But agriculture is both victim, executioner and saviour of climate change. It contributed about 20–25 % of global emissions in 2010 (Blanco, G. R. et al, 2014) and therefore it should be also part of the solution.

The greening package included in the last 2013 CAP reform is a major breakthrough in the EU farming sector to make agriculture more sustainable and climate friendly. In terms of budget, the EU has announced that it will dedicate 20% of its 2014-2020 budget to climate-related action. Moreover, the EU is involved in many other projects such as the Global Climate alliance, whose objective is to strengthen dialogue and exchange experiences and this with developing countries most vulnerable to climate change; the Global Research Alliance on Agricultural Greenhouse Gases, which aims at finding new ways to produce food without increasing emissions; or the Climate and Clean Air Coalition, dedicated to reducing short-lived climate pollutants, such as black carbon, methane, tropospheric ozone or some hydro fluorocarbons to protect human health, agriculture and the environment.

Finally, in January 2014 the EC launched a Communication on "A policy framework for climate and energy in the period 2020 to 2030" setting the EU climate objectives for that period. The targets agreed by EU Member States for 2030 are a 40% cut in greenhouse gas emissions

compared to 1990 levels; at least a 27% share of renewable energy consumption; and at least 27% energy savings compared with the business-as-usual scenario. In line with this, the EC proposed a series of policies including a reformed EU emissions trading scheme (ETS); new indicators for the competitiveness and security of the energy system; and ideas on a new governance system based on national plans for competitive, secure, and sustainable energy.

This policy framework for 2030 also targets agriculture, especially in Land Use, Land Use Change and Forestry (LULUCF). The European Council Conclusions (European Council, 2014) on the EC initiative recommend LULUCF to be included in this strategy because of the multiple objectives of the agriculture and land use sector, with their lower mitigation potential, and the need to ensure coherence between the EU's food security and climate change objectives.

In order to include LULUCF in the 2030 objectives, the EC is considering different alternatives, all of them with the objective of integrating LULUCF into the 2030 greenhouse gas mitigation framework, contributing to the EU's objective of at least 40 % GHG emission reductions by 2030, supporting progress towards the multiple objectives of the agriculture and land use sector and fostering long term competitiveness, food security and sustainability. This would be one of the main challenges for the climate and farming sector.

5 Conclusions

This paper has analysed the different challenges for the EU farming sector, both at internal and international level. Agriculture is a dynamic sector and its present characteristics are unlikely to last as most of the challenges analysed here are probably going to change in the short term. However, new challenges will arise and it is paramount that the EU is ready and prepared in order to be able to face them. The five initial objectives of the CAP recorded in article 39 of the TFUE - to increase agricultural productivity by promoting technical progress and ensuring the optimum use of the factors of production, in particular labour; to ensure a fair standard of living for farmers; to stabilise markets; to ensure the availability of supplies; and to ensure reasonable prices for consumers -, are still today valid and they are worth protecting.

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SESSION 1

Food security, trade and agricultural policy

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Decision making analysis of cotton producers via Edinburgh scale

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Abstract
Cotton is one of the strategic and important agricultural products for Turkey. But cotton harvested area decrease year by year in Turkey. The main purpose of the study is to determine the factors affecting on farmers decisions of cotton production. In addition, purposes of farmers, their thoughts about agricultural policies and returning to cotton producing in locations where cotton production decreased. The main material of the study is the datum obtained from face to face survey conducted with farmers all across production areas. Reliability Analysis and Edinburgh Scale were used for analysing the data. According to the results, the main objective of the manufacturer to obtain the highest profit and improve their living standards. Producer thinks they can get it with government supporting and best producing. At the end of the study, with determination of factors in decision making process for product grown by farmers, agricultural policies was thought to be applied more effectively and could be helpful to develop macro policies.

Key Words: *Cotton producer, farmer decisions, agricultural policies, Edinburgh Scale, Turkey*

JEL Classification: *C10, Q10*

1. Introduction

Cotton is a product having economic importance for producer countries with its common and necessary usage, value-added and employment opportunities. Cotton is the raw material in ginning industry in terms of processing, in textile industry with its fibre, in oil and feed industry with its seed and in paper industry from the point of its linter. Oil extracted from cotton seed as an alternative to petroleum is increasingly used for production of biodiesel. Besides, demand for cotton is rising thanks to population growth and increased living of standards.

However, there has been a rapid increase in the cost of cotton production and it has not been reflected exactly proportional to fibre prices owing to import constraints in recent years. Therefore, cotton areas decreased from 750 thousand hectares (1996) to 46 thousand hectares (2013) in Turkey. As a result, despite high yield varieties planted in recent years, cotton production has been decreasing gradually and cotton plantation areas have been increasingly turning into regions grown fruits. It is needed to identify affected factors on the decisions of cotton production for save strategic cotton production.

Cotton have importance as strategic product for government, as added value and profit for producer and as clothing and feeding for costumer. Controversially, cultivation area of cotton is getting decrease year after year. Thereby, cottons importance is gradually getting increase.

When we look at the data in last five years (2005-2013), it is shown that cotton cultivated 32.5 billion hectare area and produced 24 billion tone fiber cotton on the average on worldwide. India has largest cotton producing area all of the world. She is followed by China, USA, Pakistan, Uzbekistan and Brazil subsequently in the world. The top seven cotton producer are China, India, USA, Pakistan, Brazil, Uzbekistan and Turkey. Also the top three are China,

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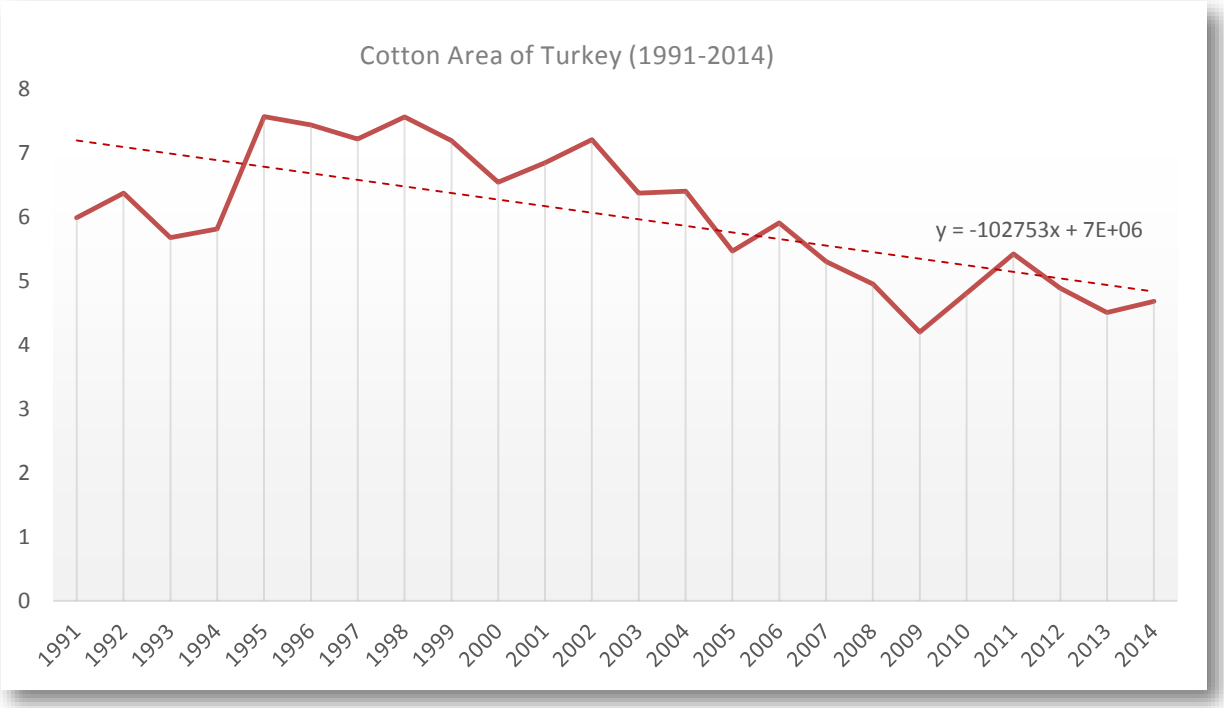
India and Pakistan respectively. And they are followed by Turkey, the United States and Brazil (FAO, 2013).

While Turkey's cotton cultivation areas about 600 thousand hectares in 1991, these areas has reduced approximately 30% in recent years. Notably, the farmers who stay in agricultural business of Aegean and Mediterranean regions has adequately gave place to cotton in the production plan in recent years. A detailed research has not been done according to the issue yet.

Figure 1: The Tendency of Cotton Area of Turkey



Source: TUIK, 2013 (www.tuik.gov.tr).

In this sense, the main purpose of the study is to analyse the decision making procedure of farmers. And to reveal the attitude, objective and behaviour of farmers by using Edinburgh Scale. To identify of the underlying cause of losing significance of cotton productions for farmer is very important information for the policy makers, businessmen, mediators, and producers.

2. Data and Method

The data that is such as to original obtained from 90 agricultural enterprises operated in Aydın region via questionnaire constitutes of main material of the study. General socio-economic information of Aydın could gain from notably Cotton Research Station, Provincial Directorates of Food, Agriculture and Livestock Ministry, The Chamber of Agriculture Engineer, Chamber of Agriculture and Industry, associations and organizations that can keep record at local level. In addition, results of research and examination carried out before on the issue and publications that are published could be benefited from.

8 cities that are Izmir, Manisa, Aydın, Denizli, Mugla, Kutahya, Afyon and Usak in Aegean Region. Cotton production can’t be performed in Afyon, Kutahya, and Usak cities

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economically among these cities. Thus, 60% of cotton production in Aegean Region produced totally is produced in Aydın city.

Therefore Aydin where produce 60% of all Turkey's cotton production is selected as study area (TUIK, 2010).

The main material of study is composed of data collected from survey study which was done cross-sectional in Aydın. Proportional approach was used in determination of number of sample that would represent the main population (Miran, 2003; Newbold, 1995).

$$n = \frac{Np(1-p)}{(N-1)\sigma_{px}^2 + p(1-p)} \qquad (1)$$

n: Volume of sample N: The number of agricultural farm in Aydın

σ_{px}^2: Variance[1] p: The rate of cotton producer[2]

According to data of official records, total farm of Aydın was 54166 (Anonymous, 2010). The sample size which was obtained with this formula according to 90% confidence interval and 10% error margin was determined to be 90 at least. The farm which is done survey has been identified randomly.

In this study, main descriptive statistics was calculated and then Reliability Analysis was used in order to determine degree of reliability of our dataset for the analysis (Tavşancıl,2005). After that Edinburgh Scale was used considering the easiness of understanding, in order to determine the affective factors on decision making procedure of cotton producer (Tatlıdil, 1996; Cankurt, 2008).

3. Results and Discussion

3.1. Reliability Analysis

First of all, reliability analysis of responses obtained from the survey questions prepared in attempt to investigate cotton production decisions of the farmers to determine reliability in the level of analysable. 41 questions that are influential on the decision prepared are studied behaviours relation with cotton production decision and 77 questions belonging to edinburg scale impending to data set consisted of 118 variables totally are determined quite reliable (0.723) and responses endowed to the variables are different from each other. According to Hotelling T2 test, differences among question averages are significant statistically (Hotelling T2: 23556.96; p:0.000). According to reliability analysis, data of questionnaires will be used trustfully in analysis.

3.2. General Information on Farmers

Individual and household characteristics of the farmers in the research region are crucial determinants on the decisions will be taken in agricultural operations. Thus, features of the farmers in relation with agriculture are needed to investigate. The characteristics of the farmers on individual and household are examined in the research region. According to this, data is collected on age, education level, and experiences on agricultural management, as well as the number of individuals in farmer households, and also the number of individuals who are engaged in farming.

[1] This value was accepted as 2.58 $s_p^2 = 0.025$ and calculated as $s_p^2 = 0.0097$.

[2] This rate is not known. In such cases, in order to enable sample size as great as posible it is suggested that the value of p=0.5 that would give the greatest value from p(1-p). Therefore in determination of sample volume, p=0.5 was taken.

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Table 1. General Information on Farmer

	Mean	Std. Dev.	Min	Max	Median
Age	48	11	22	75	48
Education	7	3	5	16	5
Experience	29	12	2	50	30
Household Individual	5	2	2	11	4
Household Agriculture	2	1	1	9	2

According to the analysis' results, some demographic characteristics on farmers such as age, education, experience, and family information are represented. It is defined that mean age is 48 and education period is 7 year in the research region. While director of the farm is engaged in farming for 29 years, farm family is comprised of 5 individuals, and also 2 individuals within the family are engaged in farming (Table 1).

When analyzed the tables, while mean age of the farmers is 49, and also minimum age is 22 and maximum age is 75 years. While the farmers take education as 7 years' period, large diversification in a vast range is seen from primary school to university. Agricultural experience is a crucial factor in agricultural decisions. While mean agricultural experience is 29 years, it shows a large variation between 2-50 years.

When analyzed household of the farmers, while individuals in the households are changing among 2-11, mean individuals per household are 5. When examined participation of the households to agricultural practices, it is seen that 2 persons support to agricultural production.

3.3. General Information on Agricultural Enterprise

Land size, ownership status and characteristics of land are important factors in agricultural practices. Thus, investigation of the agricultural enterprises are important.

The characteristics of the farmers intended for enterprise specials are examined in the region placed in the research context. Thus, data is collected on land size, ownership status, and circumstance of irrigable and non-irrigable land.

Table 2. General Information on Enterprises

	Mean	Std. Dev.	Min	Max	Median
Land size (da)	221	340	20	2750	118
Ownership status	111	113	0	500	63
Land to rent	168	358	4	2530	80
Sharecropping	223	329	24	800	60
Land to rent out	66	56	26	105	66
Irrigable land	213	335	20	2750	110
Dry farming land	83	61	30	150	70

According to data investigated, while land size of the producers is 221 da, minimum and maximum land sizes are changing between 20 da as minimum and 2750 da as maximum values, respectively. While mean ownership land size is 111 da, land to rent and

sharecropping land sizes are 168 da and 223 da, respectively. And also mean land to rent out is 66 da, ownership, it is seen large variation on land to rent, sharecropping and land to rent out. Size of agricultural enterprises is crucial factor in agricultural production decisions. Land sizes show large variation among 4 - 2530 da in terms of ownership status of the land (Table 2).

While most of the lands of the producers interviewed are irrigable land, mean land size is 213 da, minimum and maximum land sizes are 20 da and 2750 da, respectively. While average dry farming land is 83 da, it is changing between 30 da and 150 da.

3.4. Farmer Decision and Edinburgh Scale

Edinburgh Scale is one of the scales used frequently in farmer decision analysis. It investigates farmer decisions in three dimensions. One of those is farmers' attitudes, other is objectives, and the latter is behavior that is to say implementation of the decision. While preparation of the survey form, it is benefited from the study named Edinburgh Farming Objectives Scale (Willock et al., 1999; Simona and Romano, 2006; Aromolaron and Olayemi, 2000) and required modifications are made considering region conditions.

Table 3. Farmer Attitudes

	Mean	Std. Dev.	Min	Max	Median
Inexpensive government credit should be given to farmers.	4,79	0,59	1,00	5,00	5,00
Vicissitudes in agricultural politics should be declared clearly by the government.	4,72	0,78	1,00	5,00	5,00
Doing planning should be performed in order to make successful farming.	4,59	0,63	3,00	6,00	5,00
Farming is an occupation that is managed well.	4,52	0,55	3,00	5,00	5,00
Produce the best production is crucial.	4,39	0,91	1,00	5,00	5,00
Visiting to other agricultural management is important in the framework of seeing methods applied by them.	4,19	0,91	1,00	5,00	4,00
Farmer children don't want to make farming.	4,18	1,10	1,00	5,00	5,00
Farmers decide own decisions by themselves.	4,04	1,08	1,00	5,00	4,00
Decisions in relation with production are decided by farmer himself.	4,04	1,06	1,00	5,00	4,00
Farmers should make insurance.	4,02	1,14	1,00	6,00	4,00
Reading publications on agricultural practices is important.	3,76	1,32	1,00	5,00	4,00
I have a structure that is no taking risk.	3,68	1,31	1,00	5,00	4,00
Most part of the assets that will be required should be taken as credit.	3,58	1,54	1,00	5,00	4,00
Visiting of authorities to your enterprise occasionally is important.	3,48	1,54	1,00	5,00	4,00
Farming is an occupation being proud of.	3,47	1,62	1,00	5,00	4,00
Following / reading publications on agricultural practices is important.	3,47	1,31	1,00	5,00	4,00
Short term borrowings are important in farming.	3,39	1,54	1,00	6,00	4,00
Other occupations are better than farming.	3,34	1,64	1,00	6,00	4,00

I want to give up agriculture if I have a chance.	3,28	1,83	1,00	5,00	4,00
Consulting with professional advisors before decisions coupled with agriculture is required.	3,01	1,54	1,00	5,00	3,00
There is no important modern record keeping system in farming.	2,41	1,48	1,00	6,00	2,00
Taking financial risks are required in farming.	2,40	1,43	1,00	5,00	2,00
Making application intended for agricultural supports and incentives is easy.	2,28	1,38	1,00	5,00	2,00
There is no more bureaucratic transactions (document, stationary etc.) in agriculture.	2,08	1,10	1,00	5,00	2,00
Agricultural politics in the last years are suitable.	1,93	1,11	1,00	5,00	2,00

Analysis of farmer attitudes among the factors affected in cotton production decision key to Edinburgh scale is given in Table 3. Statements participated by the farmers in maximum level indicated below: 'Produce the best production is crucial (4.64); doing planning should be performed in order to make successful farming (4.63); Inexpensive government credit should be given to farmers (4.46); Vicissitudes in agricultural politics should be declared clearly by the government (4.46). On the other hand, statements participated by the farmers in minimum level indicated below: Agricultural politics in the last years are suitable (2.17); there is no more bureaucratic transactions (document, stationary etc.) in agriculture (2.25).

Table 4. Farmer Objectives

	Mean	Std. Dev.	Min	Max	Median
Obtaining highest profit as soon as possible is important.	4,79	0,41	4,00	5,00	5,00
There is needed to increase living standard of family.	4,78	0,44	3,00	5,00	5,00
Using own resources is important.	4,71	0,55	2,00	5,00	5,00
Having machines and equipment up to date is important.	4,67	0,47	4,00	5,00	5,00
Spending time with family is crucial.	4,66	0,48	4,00	5,00	5,00
There is needed to become indebted to as far as slender.	4,52	0,80	2,00	5,00	5,00
Trying to new cultivars in production is important.	4,52	0,66	3,00	6,00	5,00
Chemical fighting in suitable time and dosage is beneficial.	4,51	0,78	1,00	5,00	5,00
There is needed to leave agricultural land like receiving one.	4,51	0,69	2,00	5,00	5,00
Although people has special talents, they are still liable to natural law.	4,46	0,85	1,00	6,00	5,00
Information on political change is insufficient.	4,46	0,94	1,00	5,00	5,00
Objectives of general agricultural politics are not clear.	4,37	1,03	1,00	5,00	5,00
Decreasing of fertilizer and pesticide using with different methods (cropping, farm manure etc.) is important.	4,36	0,98	1,00	5,00	5,00
There is enough resources, as long as people knows how they will use those resources.	4,36	0,81	1,00	5,00	4,00
Plants and animals have right to exist as far as people.	4,32	0,97	1,00	5,00	5,00
Minimizing risk in farming is important.	4,32	0,83	2,00	5,00	5,00

Performing new agricultural investments is important.	4,32	0,87	1,00	6,00	4,00
Having other fields of interest apart from farming is crucial.	4,26	1,01	1,00	6,00	5,00
Authorities don't know what current legal regulations are.	4,12	1,30	1,00	5,00	5,00
World is the place that has constraint resources.	4,07	1,15	1,00	6,00	4,00
Performing cropping system is needed.	4,00	1,18	1,00	6,00	4,00
If everything continues like present day, people will be faced with a huge ecological disaster.	3,96	1,48	1,00	6,00	5,00
There is needed to continue to agriculture on no account.	3,90	1,53	1,00	5,00	5,00
There is need to gain esteems of other farmers in society.	3,80	1,27	1,00	5,00	4,00
Interfering of people to nature poses to results that generally bring disaster.	3,68	1,34	1,00	6,00	4,00
Equilibrum of nature is strong till to cope with negatif effects of industrialization.	3,68	1,30	1,00	6,00	4,00
Participate to festival and gain to prize are needed.	3,60	1,71	1,00	6,00	4,00
People has right to modification within natural environment to fulfil their's needs.	3,58	1,32	1,00	6,00	4,00
Organic agriculture is a transient eagerness.	3,54	1,79	1,00	6,00	4,00
People usually abuses to natural environment.	3,54	1,24	1,00	6,00	4,00
Taking charge in producer organizations is needed.	3,50	1,42	1,00	6,00	4,00
Working in different areas apart from farming is important.	3,46	1,38	1,00	6,00	4,00
Using credit is not good for farming.	3,44	1,37	1,00	5,00	3,50
It is not needed to tillage of land riotous.	3,23	1,54	1,00	5,00	3,00
It is required to make nonagricultural occupation to continue agriculture.	3,23	1,55	1,00	6,00	3,00
Equilibrium of the world is weak as a kitten and it is destroyed easly.	3,17	1,42	1,00	6,00	3,00
Intelligance of people renders to the world unliveable.	3,16	1,56	1,00	6,00	3,00
Environmental problems are exaggerates bellyful.	3,06	1,46	1,00	6,00	3,00
It is needed to use chemical barely.	2,89	1,61	1,00	5,00	3,00
Small scale of the firm is good.	2,09	1,40	1,00	6,00	1,00

Analysis of farmer objectives among the factors affected in cotton production decision key to Edinburgh scale is given in Table 4. Statements participated by the farmers in maximum level indicated below: 'Obtaining highest profit as soon as possible is important' (4.79); 'Using own resources is important' (4.69); 'There is needed to become indebted to as far as slender.' (4.65).

On the other hand, statements participated by the farmers in minimum level indicated below: 'Small scale of the firm is good' (2.75); 'It is required to make non-agricultural occupation to continue agriculture.' (3.28) (Table 4).

Analysis of farmer behaviours among the factors affected in cotton production decision key to Edinburgh scale is given in Table 5. Statements participated by the farmers in maximum level indicated below: "I have difficulty to meet the financial needs of my farms" (4.70); "The debts of my farms has increased for last five years" (4.30); "My financial situation were downfall in last ten year" (4.12). On the other hand, statements participated by the farmers in minimum level indicated below: "I have made a big investment for five years"(1.99); "My agricultural income has increased for five years." (2.14) (Table 5).

Table 5. Farmer Behaviour

	Mean	Std. Dev.	Min	Max	Median
I have difficulty to meet the financial needs of my farm.	4,70	0,74	1,00	5,00	5,00
The debts of my farm has increased for five years.	4,30	1,28	1,00	5,00	5,00
My financial situation were downfall in last ten year.	4,12	1,38	1,00	5,00	5,00
I check my farm's success.	4,04	1,18	1,00	5,00	4,00
I use new agricultural technics.	3,71	1,10	1,00	5,00	4,00
I put bull's eye in my agricultural production	3,61	1,33	1,00	5,00	4,00
I keep the financial record of my farm	3,43	1,61	1,00	5,00	4,00
I have a development plan of my farm over the next five years.	3,06	1,84	1,00	6,00	3,00
I have not find to meet my friend.	2,74	1,49	1,00	5,00	3,00
My harvested area has increased for five years.	2,38	1,63	1,00	5,00	2,00
My agricultural income has increased for five years.	2,14	1,40	1,00	5,00	1,50
I have made a big investment for five years.	1,99	1,44	1,00	5,00	1,00

4. Conclusion

In Turkey, cotton producible area is limited as well as overall world. Cotton producible areas is intentionally irrigated fields of southeast Anatolia, Aegean and Mediterranean regions in Turkey. That is the reason why, the decisions of farmers who are cotton producer is very important for politic decision makers, researchers, mediator, businessmen, and other market stakeholders.

All of the world, Turkey is seventh producer and second exporter country (FAO, 2013).

According to 2013 data, cotton production of Turkey can be meet the requirement just 60% although a strategic product for Turkey. That is, Turkey is obligated to import cotton in order to make it up. At the same time, cotton area should be extended using as motivating tools for farmers on cotton producible areas. With each passing year, cotton areas convert into maize and fruits areas with competitive pressure.

For this, policy makers needs to know "which effective factors on the decisions of farmers which can produce cotton". If the answer of this question can be find, cotton production can improve via some agricultural politic tools. For these reason, some findings were revealed about these issues with this realized study.

Edinburgh scale is one of the most prevalently used a scale for measuring farmer's attitudes, objectives, and behaviours. Edinburgh Scale is used in this study. According to the results, the attitudes of farmer that "Doing planning should be performed in order to make successful farming" and "Produce the best production is crucial". In terms of farmer's objectives, farmers aims that "Obtaining highest profit as soon as possible is important" and "There is needed to increase living standard of family". If it is seen the side of farmers behaves that, they are in a struggle for finance of their farms but the debts of farm has increased in last five years. And financial and economic situation are getting bad in last ten years. Any investment was not made in farms for a long period and decreasing of harvested areas is identified with this study.

As a consequence; farmers would like to produce cotton due to practice and knowing of the cotton production, suitable equipment existing, storability, easy marketability. However, farmers have given up cotton production due to the cost is higher and profit is lower than alternatives. Particularly, policy maker should take steps for regulations of cotton market and farmer price of cotton.

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Priority directions of development of export agro-food productions of Ukraine

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Abstract
In the article were determined main trends of development of agro-food export of Ukraine. On the base of the complex analysis of the commodity structure agro-production was discovered its disadvantages and was offered the paths of solutions. As a result of the given research of geographical structure of export agro-food production of Ukraine was found essential changes on the different segments of world market for some groups of commodity in the volume and dynamics. It was grounded the paths of development foreign trade of agro-food production and food in the context of functioning Free Trade Agreement between Ukraine and European Union. It was offered the priority directions of development of domestic export agro-food productions in the current conditions.

Key words**:** *foreign trade, agro-food production, export, import, globalization*

JEL Classification*: F16, F18, Q17, Q11*

1. Introduction

In a globalized world economic development of foreign trade and networks are important factors of functioning any national economics and state because it has not only economics meaning, but also political one. Moreover, the challenges that linked with the globalization agro-food systems leading to the acceleration of the expansion of world food trade, compared to the growth of agricultural production and food products. During 2013-2014 Ukraine has lost control under the Crimea and the part of Donbas's territory, which led to the changes in foreign trade in particular agriculture. In such realities consider that the most important issues in the process of integration into the world economic community is the transition to a qualitatively new and effective foreign economic relations in the agricultural sector of Ukraine.

2. Material and methods

The given research is based on general scientific methodology. During the process of research there were used a system analysis and synthesis, monographic, abstract, logical, economically mathematic, grouping, computational and balance methods of scientific researches.

3. Results and Discussion

Entering to the World Trade Organization (WTO) in 2008, signing the association agreement between Ukraine and EU and creation according to this agreement free trade zone. Consequently, this all led to the establishment by Russian Federation trade war against Ukrainian agriculture productions. These actions have changed completely the strategy and forced Ukraine to look for the new markets for agriculture goods.

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The country has more than 40 million of the population, 3 out of 40 million are employee in the agriculture. Ukraine has a huge potential and can provide high level of production and accelerated development of manufacturing and exporting agro-food production. Agriculture sphere of Ukrainian economics has demonstrated good results in such extreme conditions. This is the only industry, which still has positive index compare to the others. This industry provides 20% of employment rate in Ukraine, manufactures production in 2, 5 times more than it can be consumed. Furthermore, export surpluses carried out in nearly 190 countries, and actually make foreign economic trade balance of the country, supporting the currency. Each third earned dollar is the result of agriculture activity. During 2014, more than 14% of the total GDP was provided by the agriculture and food industry, and this share always grows. Thus, if I quarter of 2013 it was 3.1% and for I quarter of 2014 year was 3.3%, over the corresponding period in 2015 - already 4.3%. However, the possibility of the industry is far from being exhausted. Consequently, nowadays, the development of exports is a key task to improve the production with value added **[Sledz']**. Made research has shown that Ukrainian agriculture economic sphere is one of the key positions of foreign trade turnover of Ukraine **[fig.1]**.

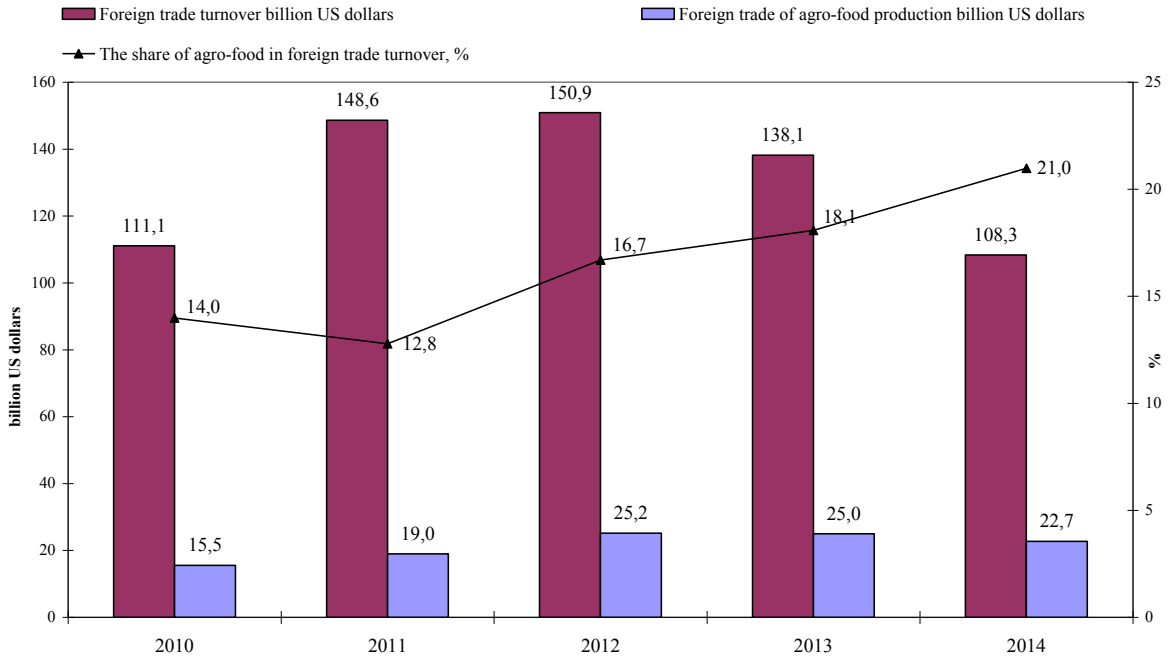

Fig. 1. Foreign trade turnover of Ukraine

Source: Calculated and built according to the State Statistics Service of Ukraine

Following the results of 2014 of foreign trade turnover of Ukraine has become 108,3 billion US dollars. During the period from the 2010 and 2014 the share of agriculture production in the structure of turnover constantly rise from 19,3% in 2010 till 21% in 2014. This tendency saved also in 2015 the share of agriculture production in the general foreign trade turnover (42,4 billion of dollars US) has consisted 23,4% or 9,9%. Total export in 2014 was 16,7 billion US dollars or 31% of total export of Ukrainian good; import was 6,1 billion dollars or 11,1 % of total merchandise imports of Ukraine. The period from January-June in 2015 has illustrated the picture of positive dynamic. Export of agriculture production for the certain period became 7,7 billion dollars US or 35, 7% from the total export. Import was 2,2 billion dollars or 10,5% from total import. Last year Ukraine had a trade deficit -527 million dollars US but in 2014, the trade balance of agro-food production was positive and the corresponding period of 10.6 billion dollars US. This trend was stored also in 2015, where foreign trade balance for the 1st half of 2015 is positive and 5.6 billion dollars.

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For the last 5 years extend of volume agriculture production in Ukraine has affected rise of exporting ago-food production. **(table 1).**

Table 1 Commodity pattern of exports agro-food production of Ukraine, 2010-2014

	2010		2011		2012		2013		2014	
	mln dollars US	%	mln dollars US	%	mln dollars US	%	mln dollars US	%	mln dollars US	%
Agri-food exports million dollar USD.	9849,8	100	12732,3	100	17791,4	100	16930,0	100	16669,0	100
1. Live animals, animal products	770,8	7,8	935,0	7,3	959,2	5,4	1083,1	6,4	1014,5	6,1
2. Plant products	3949,9	40,1	5514,5	43,3	9173,1	51,6	8849,1	52,3	8736,1	52,4
3. Fats and oils of animal or plant origin	2605,0	26,4	3380,8	26,6	4184,6	23,5	3497,4	20,7	3822,0	22,9
4. Finished food products	2524,1	25,6	2902,0	22,8	3474,5	19,5	3500,5	20,7	3096,3	18,6

Source: Zovnishnya torhivlya Ukrayiny: statystychnyy zbirnyk / [vidpovid. za vypusk A.O. Fryzorenko]. – K.: Derzhavna sluzhba statystyky Ukrayiny, 2015. - P. 33-35.

According to the data from the government STAT more than half of the export volume of the agriculture production was provided by plant products (51,4% in 2014), mainly by selling crops: corn and wheat. Thus, in 2014 maize exported 17,6 million tons of wheat and 10,5 million tones, Which is 900 thousand tons and 2700 thousand tons more than in 2013. This led to the expansion of trade networks on the world market of grain products.

The key player in importing Ukrainian production from 2010-2014 were Spain, Egypt, China, The Netherlands and South Korea. However, only in the first half a year China has taken first rank in importing Ukrainian corn (90% of all exporting production). The main partners in importing Ukrainian wheat was Egypt, Spain, Pakistan, South Korea and Morocco. Barley was delivered from Ukraine to the Middle East: Saudi Arabia, Iran and Jordan.

A significant share in export of agriculture products account for seeds and oleaginous fruits 3,9 million tons or 10,1%. Exports of this group is developing most rapidly - in 2014 it was increased by 64,1% compared to 2010.

The data from table 1 depicts that not only according to the seeds groups and according to fruit oilseeds of Ukraine have increased in export, but also processing products from them. In 2014, exported fats and oils of animal or plant origin was more than in 2010 by 68.2% and amounted to 3.9 billion dollars US. In general, in 2014, the growth of volume of exports sunflower oil was linked with extending its geography, which has been delivered to the 94 countries of the world (the mail deliveries were done to the Turkey, Pakistan, Belgium, The Netherlands and France). Furthermore, in 2015 (January- June) China joined the list of major importers - almost 97% of all exports of sunflower oil.

Ukrainian sunflower oil on external market especially in Asian and European markets successfully compete with palm and olive oils, which are historical consumer preferences of the population of countries and continents.

However, there is a negative balance in livestock compare to the crop production from 2010 till 2014. Consequently, in 2014 the export of these goods were 92, 6 million dolars US, which is on 8% less then it was in 2010 with 109, 6 million dollars US. The main part of livestock export went to Commonwealth of Independent States (CIS) more than 80% and to the Europe only 3 %. This was based on, firstly, the low quality of Ukrainian meet, diary production and milk that the criteria are only suitable in CIS markets, many of which have not yet raised their standard

requirements to EU standards. As it is known, Legislation of the European Union has very stringent requirements for quality and safety of food supplied to the EU. From these groups only poultry meet can be exported to the EU zone. In 2014, European Union tariff quota for duty-free import of poultry meet amounted to 36 thousand tones, which was contracted quickly [**Ugorenko**].

Russian Federation launched the trade wars against Ukraine. The annexation of the Crimea and Donbas hybrid warfare was the result of changing the land bank of Ukraine. In addition to that, implementing the Agreement on deep and comprehensive free trade with EU countries resulted in the loss of major trading partners in exports agro products (only the first half of 2014 - on the total volume of domestic exports to Russia collapsed by 25% (to 5.7 billion dollars USA), compared to the previous year) led to dramatic changes in its geographical segment.

In 2014, the diversification of sales markets of food and agro production had happened. A number of export to the CIS countries had declined to the 31%. However, export production had increased to the USA on 33%, to Asia on 10%, to the European Union on 4%, also changes in the geographical structure of the particles upwards exports to Asia(the export share is 46,6%, 12,8), USA(the export share is 0,3%, 0,1), other countries (2,7%, 0,9). Top-10 importing countries of Ukrainian agriculture production are China, Egypt, India, Turkey, Spain, Iran, The Netherlands, Italy, Poland, and Belarus. During seven months of 2015 it has been exported production on amount of 4,4 billions of US dollars, which is 56,9 % of total agriculture export.

According to our research, the fact that development of foreign networks in agriculture it is advisable to focus primarily on diversifying export markets with the goal of preventing economic dependence on individual countries and regions. The state has to play a key role in effective foreign policy, which main goal is to provide for the domestic producers of agro-food products the direct access to foreign markets. In this aim, exporters should be interested as well because of the profit-orientation. Supporting the same goal, producers have to be flexible and be ready for changes, even look over their type of production. Moreover, Russia Federation has provided all necessary conditions to diversification, as it was the main trade partner of Ukraine in the past. 10th September 2014, she had accepted government resolution №959 “On the implementation of import duties on goods originating in Ukraine”, and the act of it is going to happen in 1of January 2016, where the association agreement is going to start. Dairy, meet products, vegetables, fruits and nuts originated in Ukraine are going to be forbidden on the territory of Russian Federation according to the given resolution. In fact, implementing in the action this resolution means embargo on Ukrainian agriculture production. However, the process of changing the geographical is already working. According to the State Statistics Service of Ukraine: in January-June 2015, the share of total exports do not exceed 2% **[Sledz'].** In 2014 during the seven months Ukraine had exported dairy production on 84,2 million US dollars, nevertheless, in 2015 for the same period Ukraine has exported production on the sum of 1 thousands US dollars.

Hence, drastic changes, which has happened in geography of national agro-food export of current year illustrates that it has already changed and do not focus on the Russian sales market. This fact shows that in 2014 focusing on the different world markets Ukraine has occupied first place in the world with exporting sunflower oil; third place with exporting grain; fourth place was taken by exporting corn, fifth place got by exporting sorgo; seven place by exporting wheat and soybean; and eight place in trading poultry meet.

Along with that, effectively implement the new strategy of export expansion must be decided on specific regional priorities and possibly the priorities by countries. This selection should proceed with a comprehensive evaluation of the opportunities and needs of the national

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agricultural sector, as well as geopolitical and economic importance to us of a particular region or country.

The significant growth of Ukrainian export production after entering the WTO and after the sanctions set up by the Russian Federation regarding diary and meet production, and confectionery, and other production put the Asian segment of agro-food market in the first place of Ukrainian exports. During 2013-2014 Asian countries has started actively importing Ukrainian production were China, Pakistan, South Korea, and India.

It should be noted that quite promising for Ukrainian agriculture products in this group of countries is China market, the export to which is growing rapidly. Customs statistics of exports demonstrates it. Only for the last 7 months in 2015 agriculture export of Ukraine to China has become 889,7 million US dollars, which is twice bigger than previous index with 407 million US dollars.

In terms of the individual headings pleased to note that for the year in exports to China have increased not only the same position as export grain and sunflower oil. Exports grew twice (chocolate, confectionery 1.2 times, alcohol is almost 6 times). That is significant shifts in export not only raw materials, but also the food industry.

For increasing export to China Ukraine has all conditions for it. The state level of country has done quite intensive work for boosting of agro-food exports and extending the sales market. Negotiations have been conducted with the leadership of the Export-Import Bank of China, representatives of the General Administration of Quality Supervision, Inspection and Quarantine of China, the Chinese corporation export credit insurance, business representatives, state agricultural organizations and agricultural associations. As a result of these negotiations, in the nearest future Ukraine will receive permission to export sunflower meal to China. In addition, the General Administration of Quality Supervision, Inspection and Quarantine of China (AQSIQ) plans to provide appropriate permissions. The Chinese side also assured that no additional requirements for Ukrainian sugar, wine and confectionery. Evidently, domestic exporters will export and are able to export these products.

According to analysts and experts, currently domestic producers of agro products are using its export potential to the China only at 7,5%. Consequently, increased cooperation prospects are extremely significant.

Thus, agro-food production in Asian region is quite competitive, and commodity nomenclature of imported food of these countries almost coincides with the structure of Ukrainian exports. Given the fact that domestic agricultural products are very competitive in this region, and then these foreign markets are appropriate further expansion of mutually beneficial trade and economic relations with the Asian segment. Based on features of Ukrainian AIC, the formation conditions of demand in the countries of the region in the long term it is important to consolidate utilized agro-food market segments, including seeds and sunflower oil, cereals, and make efforts to expand the geography and commodity structure of export agro-food products [**Dudar**].

The results of research has shown that from 2010 till 2014 the most dynamic increased in export Ukrainian agro-food production was to the African countries – in 8 times, to Asian countries - in 6 times, to Europe- in 5,1 times, and to the CIS countries only in 1,9 times. During these four years African segment of Ukrainian export rose from 440,7 to 3488,2 million US dollars. The main import for African countries were grain - 71,2% and sunflower oil - 23%.

Among major integrated international associations of Ukrainian imports of agro-food products are the countries of the Customs Union, exports from Ukraine, which in 2014 compared to 2010 according to the State Statistics Service of Ukraine decreased by 31%.

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There was a gradual loss in the past. The traditional and most important for Ukraine CIS market segment, which in best times accounted for the bulk of Ukrainian agro-food exports (44,3% in 2005). Moreover, a number factors in the conduct of foreign policy, especially Russia, which was the main buyer of dairy and meat products of Ukrainian production.

Along with that, economic and technological community, which is saved and complementarity Ukrainian economy with given countries, existing of huge market, and also source of scare raw materials and already formed transport infrastructure, which create suitable conditions for wide development between not only in trading, but also in scientific, technical, scientific and industrial cooperation in agriculture. Hence, gradual recovery and strengthening the competitiveness of domestic exports in these markets should take place in parallel with the intensification of export diversification in other areas.

Important and perspective market segment for Ukrainian agriculture is European Union market. It is the biggest trade Ukrainian partner of agro-food production; its importance grows every year. With the expansion in the south-east towards the EU turns into the most powerful in the world market, which has more than 500 million consumers. Today it is a continental formation unites 28 states with territory nearly 446,8 million hectors. Earth provision of EU public lands for agricultural production is an average of 0,34 hectares. Rural occupies about 90% of the EU territory, home to more than half of its residents [**Kvasha**].

It is relevant to note that members of EU makes inter-trade between countries, which provides economic integration within Economic Community. Evidence of this is that more than 75% or 295 billion 608 million euro the volume of trade is between them, while a quarter of trade is with other countries.

Bilateral trade turnover of agro-food products between the EU and Ukraine significantly has increased since 2008, due to Ukraine's accession to the WTO, and later in 2014, the ratification of the FTA. Thus, in 2010 the figure was 4,1 billion US Dollars and in 2014 reached 7,3 billion US Dollars USA. The share of the European Union in general foreign trade balance of Ukraine is 3,1%. The trade balance of agro-food production between EU and Ukraine, except in 2010, was positive and was 2,3 billion US dollars in 2014, resulting from the implementation of the Agreement on deep and comprehensive free trade area. Increasing in volume of export in EU countries during investigated period between 2010 and 2014 can be explained by many factors such as favourable situation on the international market, the use of autonomous trade preferences by the EU[1], the devaluation of the hryvnia, which increased the price competitiveness of Ukrainian products, and Ukrainian gradual harmonization with European standards.

The main items of Ukrainian exports to the EU are raw plant products (seeds of grains and oilseeds), fats, and oils of animal or vegetable origin (unrefined sunflower oil and other oils). Its exports to these headings average for 2010-2014 accounts for 78,2%. Another group holds 18,9% of finished food products.

The raw material export orientation of Ukrainian foreign trade position makes Ukraine vulnerable, as demand for commodities is volatile and characterized by significant price fluctuations. At the same time, imports from the EU agro-food products decreased in 2014 by 19,2% or 588.2 million US dollars compared to 2013, resulting from the devaluation of the national currency of Ukraine, import-substitution and a decrease in consumer demand.

[1] The autonomous trade preferences include the abolition of import duties on most industrial goods (commodity groups 25-97) and agricultural products and food products (1-24 commodity groups), implementation of zero tariff rate quotas (TRQ) for 16% of agricultural and food products.

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The basis of Ukrainian imports from the EU are products with high added value (-18,4% livestock products and finished food products – 48,3% in 2014).

Above mentioned studies of APD shows that the reduction of import tariffs of Ukraine may increase imports to 7%, mainly due to increased deliveries of drinks, vegetable oils and fats, meat, mineral or chemical fertilizers, animal fats and oils, and sugar. Thus, it appears that the benefits received by Ukraine are likely to be higher than for the EU, at least in the medium and long term.

According to estimates the APD, the abolition of import tariffs EU foreseen in the DCFTA can lead to an increase in agro-food exports by 18-20% during the first ten years of trade liberalization with the EU. It is expected that most export growth will be observed for grain, tobacco, meat and other food products. Ukrainian Cancellation is export duties may double oil exports within ten years. In addition, the liberalization of trade with the EU could result in the volume of exports of 2.3 billion. Dollars. USA, which is not exported by Ukraine. This is especially true for dairy products and birds' eggs, cereals and their products, meat and meat products, marine products, fixed vegetable fats and oils and specialized equipment.

Summing up, it should be noted that the introduction of autonomous trade preferences yielded first promising results in terms of growth of exports to EU countries and also contributed to the improvement of standards of quality and food safety, opening export opportunities for Ukraine.

However, implementation of the DCFTA January 2016, that, bilateral reduction or elimination of import duties on most goods on both sides, will increase competition in the domestic market of Ukraine.

Analysis of trade relations between Ukraine and the EU suggests potential for increased cooperation within countries. Delayed implementation of the FTA gives the government more time to conduct the necessary legislative changes. Ukrainian business has adapted its production processes and standards to EU requirements to strengthen competitiveness on the EU market and to retain and expand its position in the domestic market. The main task in the coming period on export is all necessary legislative changes. Ukrainian business has adapted its production processes and standards to EU requirements to strengthen competitiveness on the EU market and to retain and expand its position in the domestic market; on imports - rationalization of the structure of Ukrainian imports - imports from these countries agro-industrial production of new technologies and their scientific, technical and economic assistance in creation of means of production for such technologies in our country. As a result of the FTA will be winners and losers, both in Ukraine and in the EU, and everything will depend on the competitiveness of each company. However, the FTA will increase the welfare of both parties.

4. Conclusion

Thus, according to a study foreign vectors of agro-food market in Ukraine can be concluded that, without prejudice to the economic integration with the EU, Ukraine in any case should not limit relations with other segments of the food market of the world - Asia, Africa, Customs Union. This cooperation will certainly have problems and inconsistencies that require attention, detailed analysis and solution in terms of preserving national interests and economic security

of Ukraine. At the time of concluding, the Association Agreement between the EU and Ukraine should use the opportunity

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The state of rural women and their role at the achievement of food safety

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Abstract
The submitted scientific paper deals with subject of women's role and position at the development of agricultural production and rural development in the current phase of the global economic dimensions. The authors 'prime objective in this paper is to analyze and to evaluate the issues of rural women's entrepreneurial activities in the fields of agriculture. The data are obtained from own research, furthermore, from the FAO, EU databases and ILO. The research activities are alongside of global approach focused on the selected European Union 'states and on the non-European Union states. The results of the paper confirm that if in the global circumstances the higher involvement of rural women into the agricultural and into the rural areas 'development, would be the reality, then this would lead to their better social status and to the new labor opportunities. Beyond of this, is confirmed that rural women play meaningful role at the sustainable management of natural resources. The important role for rural women represents education, extension service, social and professional alliances. The personal knowledge and capabilities of rural women confirm that they are prepared for managerial positions in the agri - food businesses and for entrepreneurial activities. They have the capabilities to diversify agricultural and rural activities and to create new employment opportunities in countryside.

Keywords: *entrepreneurial activities, food security, rural development, rural women, status*

JEL classification: *E240, O18*

1. Introduction

Women play in human society an important role in every stage of its development. Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include cultivation of agricultural crops, farming animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not always perceived as economically active employment in national accounts, but they are essential to the well-being of rural household (Doss & Raney & Anriquez & Croppenstedt & Gerosa & Lowder & Matuscke & Skoet, 2011) According to the FAO (2011), women provide in some developing countries up to 50 percent of agricultural production. In spite, of their active participation in agriculture and rural development, women often face barriers in access to productive resources and for business opportunities. In addition, the gender inequality is further complicating their opportunities in business. However, women are eligible to become a good entrepreneur or manager. Women are more flexible and handle easier more tasks simultaneously. In general women are considered as the strong personalities with exceptional leadership qualities. From the leadership point of view the women are good in diplomacy, they are intelligent, open minded, good listeners, typical for them is integrity, inclusiveness, humanity and generosity, they have also good sense for humor and they are excellent communicators. Even the female management style is considered as their advantage. Nowadays, the management gurus are openly recognizing that female management style is often their competitive advantage

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(Kadlečíková, 2011). Education of rural women is also important. According to Becker, Hubbard and Murphy, (2009) and Malhotra, Pande and Grown, (2003), the wealth of developed countries is based on a highly educated population. Education is an important tool for empowerment. The number of empirical studies has found that the upgrade in women´s education, increases wages and these returns from education to women are frequently greater than for men. Empirical evidence also shows that a mother´s education has a positive impact on child survival, education and nutrition status.

2. Methodology

The main objective of this paper is to analyse and to evaluate the issues of rural women's entrepreneurial activities in the fields of agriculture and food processing and their relation to the improvement of the food security and safety.

The data was gathered from own authors' research and other secondary data taken from FAO, European Commission and Eurostat. These databases are focused mainly on rural women, their position in agricultural businesses in comparison with males, age structure of men and women in the predominantly rural areas. Further, data deals with kind of women's farming activities, also whether they are interested in field of organic farming. In to research are included European Union countries and some European countries which are not in European Union too. For better comparison the data are divided into three groups. First is EU-28 (all EU members states), EU-15 (original EU members states - Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden and United Kingdom. Third group is represented by EU-13 (new EU member states - Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Lithuania, Latvia, Malta, Hungary, Poland, Romania, Slovak Republic, Slovenia).

3. State of Rural Women in Europe

There is difference among the women from Eastern Europe and those from developing states. They do differ by the level of education. Women from Eastern Europe have 1, 6 times higher education level in comparison with men. Furthermore, among the countries, there are differences, which change in time, due to various social, cultural, religious and economic factors. In developed and developing countries are significant differences with regard of wages between men and women. Practically, this means that discrimination is still the one of factors which has impact on reduced earnings of women. In the Czech and Slovak Republic, the income gap between men and women is up to 23, 6 percent. From this indicator, the most unfavourable result was achieved by Estonia with 30, 3 percent. The similar level of the above indicator as in Czech and Slovak Republic, is noted in Cyprus - 23,1 percent, Germany – 23 percent, Netherlands – 23,3 percent, Finland – 20,0 percent, United Kingdom – 21,1 percent, Greece – 20,7 percent and Lithuania – 20,0 percent. The best results are registered in Italy – 4, 4 percent, Malta – 5, 2 percent, Poland – 7, 5 percent, Portugal – 8, 3 percent and Belgium – 9, 1 percent.

Rural women achieve managerial positions first of all in agriculture (21 percent), in their own businesses (14 percent), in small companies (14 percent), in large enterprises (10 percent). From the above said for women is important to start with own business. However, for this is reasonable to have easy access to the financial resources. Financial services, for example savings, credit and insurance provide opportunities for improving the output of agricultural production, to reduce the risk of production, to ensure the growth of food security and safety, as well as to improve the economic vitality in the rural areas. Many examples confirm the

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significant differences between the capabilities of men and women in access to loan. If loans are granted to women, so often it is only through micro loans which may be difficult to develop effective agricultural and rural activities. Micro loans schemes help women mainly in developing countries, but also in less developed economies (Armenia, Georgia, Bosnia-Herzegovina etc.). Through loan acquisition, rural women achieve independence their businesses, but also their social security is improved.

However, rural women mostly are not willing (mainly due to lack of self-confidence), to start with their own business. For example, research made by Lithuanian Institute of Agrarian Economics has indicated several common problems that rural women face with, while considering or creating their own business. These problems are (in descending order of importance), lack of money for starting business, difficulties of forecasting the demand for products, fear of risk or failure, lack of initiative, limitation of local market, lack of knowledge, insufficient support from government, lack of information, other reasons (Maskoliūnaitė & Pareigienė, 2004).

4. Rural Women and Agricultural Labour Market

Rural women have no easy position in the world. There is some gap between man and women in their rights and role in the labour market. In the employment gap is difference between the share of rural women in the population and in the labour force. In Slovakia, this gap is about 8 percent. This practically means that the share of working women in Slovak population is about 8 percent higher than the share of working rural women, so about 8 percent more rural women are unemployed. The highest unemployment rate of rural women is in Malta with 14 percent. This situation is similar in Greece and in Italy with 12 percent. The lowest unemployment rate of rural women is in Scandinavian countries with 3 percent.

Another difference between man and women is in employment rates. In most European countries, women have higher unemployment rate than men in predominantly rural regions. The highest gap in employment rates between men and women is in Greece with 22, 3 percent. This actually means that in Greece, mainly in rural areas, are employed about 22, 3 percent more men than women. The second highest difference is in Czech Republic, nearly 17 percent. Lowest gap is in Latvia and Estonia, only about 1, 5 percent. Slovakia is on the fifth position, there is employed 13, 4 percent more men than women in rural regions (figure 1).

Women and men working in rural settings are often involved in numerous activities. For instance, they may change their work depending on the season, or may remain unemployed or underemployed for periods of time, due to their significant involvement in seasonal and part-time jobs. In rural settings, the domestic sphere and market production appear to be more closely linked than urban areas, and production activities, which rest to a large extent on the fact that women are faced with poor infrastructure and a lack of facilities.

Furthermore, we dealt with comparison women and men employment from the perspective of economic sectors, namely agriculture, industry and services (table 1). The collected data are for three regions, the whole World, European Union states plus advanced countries and Central plus South East Europe plus the CIS. At the world in agricultural works slightly more as 34 percent of the population, women employed in agriculture are representing 36, 3 percent and 32, 8 percent of men. Much smaller numbers are for the EU states and developed countries, where agriculture employs only 3, 8 percent of population; women are representing 2, 9 percent and men 4, 4 percent. In Central and South Eastern Europe and in CIS, work in agriculture in total 19, 9 percent of the labour forces, 20, 3 percent of women and 19, 7 percent of men. In contrast, at the servicing activities, work in the EU states 10, 7 percent of

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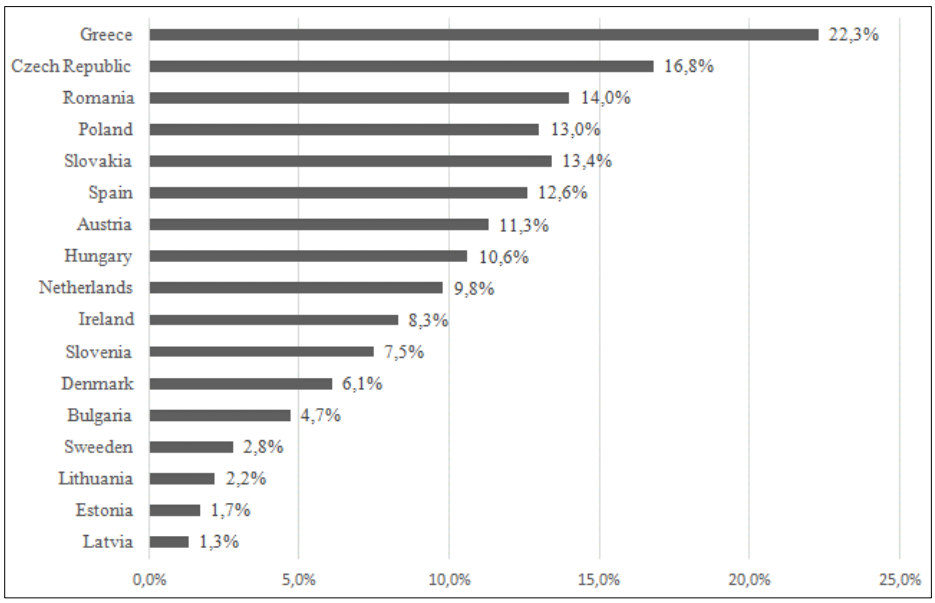
women and 31, 5 percent of men. Most of the population is employed in services; it is up to 86, 3 percent of women and 64 percent of men in the EU. In Central and Eastern Europe are employed in agriculture about 17, 4 percent more women in comparison with the average of European Union states.

Figure 1: Differences between men and women in employment rates in 2013



Source: Eurostat

Table 1: Distribution of female and male employment by sector in 2011

	World			Developed Economies and European Union			Central and South Easten Europe & CIS		
	total	Female	Male	total	Female	male	total	female	male
Agriculture	34,1	36,2	32,8	3,8	2,9	4,4	19,9	20,3	19,7
Industry	22,1	16,2	25,9	22,1	10,7	31,5	26,3	18,2	32,9
Services	43,8	47,6	41,3	74,1	86,3	64,0	53,8	61,6	47,5

Source: International Labour Organization

With regard of age structure, female farmers tend to be older than male farmers. Trend in European Union is still typical high age in this kind of jobs. The higher age than 65 years in 2010 had about 39 percent of women. On the other side, male farmers represent about 28 percent. This is category with the highest difference between men and women. Very low number of women has age category less than 25 years. Only about 1 percent of rural population from this age category is working in agriculture. In category from 25 to 35 years works in the farming 5 percent of women and about 6 percent of men. There are 16 percent men and 13 women from 35 to 44 years. In age from 45 to 54 years are about 23 percent men and 19 percent. The age category from 55 to 64 years is represented by 23 percent men and 22 percent women.

Regarding the level of education, the percentage of women who graduated from tertiary agricultural education is 47 percent in Slovakia (2010). In Czech Republic this indicator in education, achieved nearly 59 percent of women and the same result was noted in Slovenia. For instance in Poland it was noted 56 percent, in Latvia 57 percent, in Lithuania 53 percent, in Hungary 49 percent and in Armenia 39 percent.

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5. Women as a Farmers

In average women´s farmer own farms with 5, 8 ha of agricultural land and generate about 8 850 Eur in standard output. They do employ less than 1 full-time worker (0, 6) and have slightly more than 3 livestock units. Average age of women in this kind of farms is more than 55 years.

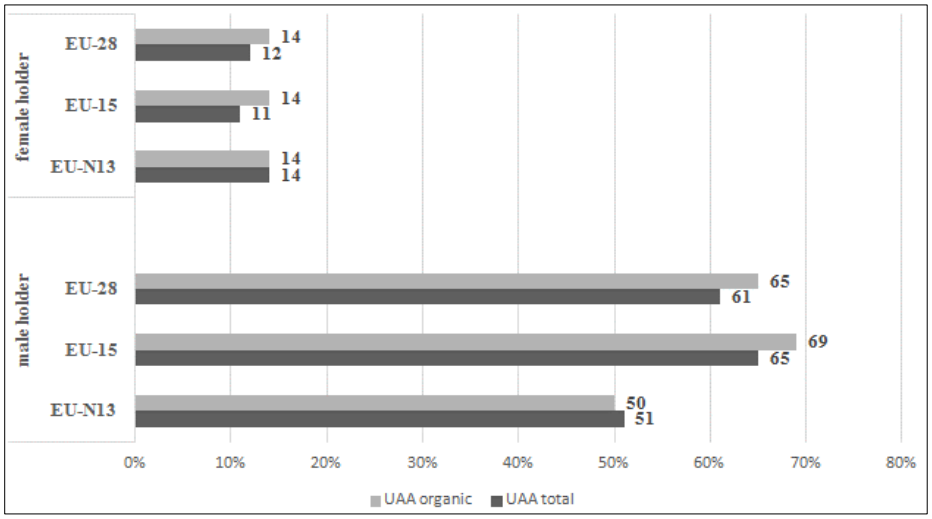
Women tend to be specialised in crop farming. In category mixed cropping women have about 5 percent production. In specialised farms with permanent crops, women produce about 3 percent more than man. Almost 30 percent of women´s production is in specialised field crops. In animal production, women lag behind men. Women produced about 4 percent less than man in mixed livestock. In category specialised on grazing livestock, women 'share on production is only 10 percent, the same indicator in men category records nearly 19 percent.

6. Women as Owners of Agricultural Area

Women only hold a small share of the agricultural area. In terms of the ownership of land is the most favourable situation for women in Italy (32 percent) and in Romania (30 percent). Surprisingly, the least favourable situation is in Germany (10 percent) and in Denmark (12 percent). In the Czech Republic and in Slovakia, the situation is identical (18 percent).

It is interesting that women prefer organic and classic farming (figure 2). In EU-28 in total area women own 12 percent of land and in case of man this indicator is even 61 percent. Inside of EU in to organic farming are involved 14 percent women and 65 percent of men. In EU-15 own organic farms 69 percent men and 14 percent women. In EU-13 we cannot recognize preferences in favour of organic or classic farming, this is documented by the following results: 14 percent of women own organic area and 14 percent of them own classic farms.

Figure 2: Total and organic farm area by holder in 2010



Source: Eurostat

If we would try to see the differences among men and women from the point of view of the physical and economic size of the farm, then we can conclude that women in the Europe, regardless whether they are from new or from the original EU states, they as an owners achieve lower turnover and they do own smaller farms in comparison with men. In the EU-28 the male's holders own in average the farm with size 12, 88 hectares of the UAA/holding,

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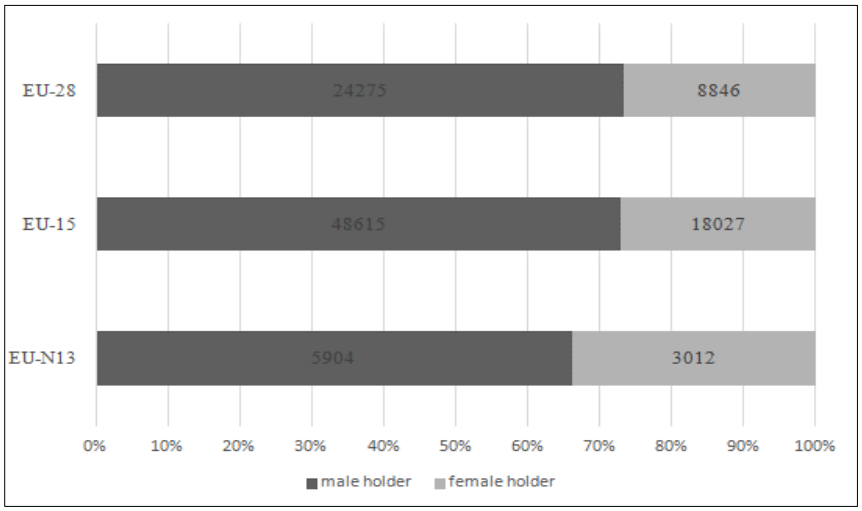
meanwhile, in the case of women this indicator achieves only 5, 84 hectares. The difference is 7, 04 hectares. This difference is significantly higher in the original EU member states, where the average size of the farm in the case of males is 22, 91 hectares UAA/holding and in the case of females it is only 10, 08 hectares, the difference is about 12, 83. The smallest difference is in the EU member states, just 2, 17 hectares (figure 3).

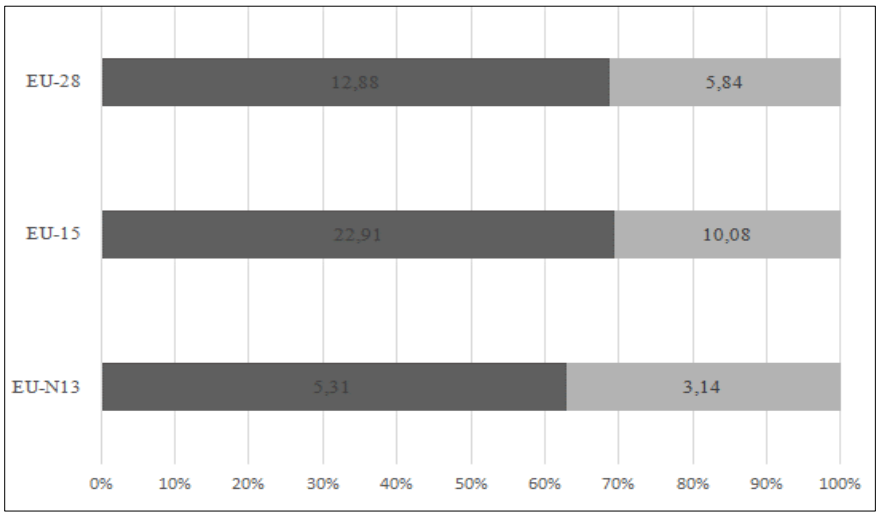
Figure 3: Physical farm size in the EU in ha UAA/holding in 2010



Source: Eurostat

When we analyse the farms 'economic size and take into consideration gender differences, we can state that the differences are the highest at the EU-15 states, in these states the standard output on the farms which are owned by men is 48 615 Euro and in the case of women 18 027 Euro, the difference is then 30 588 Euro. The smallest difference is in the EU-13 states, only 2 892 Euro, In the EU-28 this indicator is at the level of 15 429 Euro (figure 4).

Figure 4: Economic farm size in the EU in standard output in Euro/holding in 2010



Source: Eurostat

7. Conclusion

In many countries of the world rural women are engaged in agricultural production, provision of water and other necessary things for the family. In addition, they are doing activities outside the farm, to improve the living standards of families. Furthermore, they care for

children, the sick and the elderly people. The main objective of this paper is to analyse and to evaluate the status of rural women in the labour market and the issues of rural women's entrepreneurial activities in the fields of agriculture.

In Slovakia, the percentage of women who are graduated from tertiary agricultural education is 47 percent (2010). According to Becker et al. (2009) and Malhotra et al. (2003), the wealth of developed countries is based on a highly educated population. Education is an important tool for women's empowerment and it is meaningful for increasing rural women' status in the society. Rural women participate to a lower degree in the labor force than women in the cities and urban areas. Women own agricultural areas less than men and only small percent of rural women own their own farms, nevertheless women provide a substantial share of agricultural production from the global point of view. Farms held by women tend to be very small and the holders are mostly rather old.

The increased proportion of women working in the agri-food sector as well as in rural areas, could result in: to increase of the living standards, to greater social security, to new job opportunities, to increase the export opportunities of the agricultural sector, the filling of local markets features regional products under the philosophy that what is produced in the region, will also markets its realized. Disadvantage of rural women is that they does not participate in political activities and thus do not determine the development of the company. For women it is significant that they are afraid to take risks, they have lack of confidence, language skills and limited knowledge in obtaining funds from the EU and other international organizations, respectively other international organizations. However, their personal knowledge and capabilities are confirming that they are prepared for managerial positions in the agri - food businesses, for work in business, respectively in logistics organizations. They have assumptions to diversify rural activities, create employment opportunities and inspire their surroundings for new things.

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Market trends of oilseeds production in Ukraine

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Abstract
This article analyses the recent research on the production and development of the oilseeds, set production dynamics and structure of sown areas of oil relative to the area of industrial crops. Defined synchronicity yield fluctuations sunflower, soybeans and rape seed. Established correlation between the yield of certain types of oilseeds and proposed strategic priorities for future development of oilseeds market. Production of oilseeds for agricultural enterprises is one of the main sources of profitability that allows for their efficient operation. Production of oilseeds plays an important role in providing valuable food, livestock industry - nutritious food, processing industry - with raw materials. In a market economy to the economic oilseeds are the reliable source of cash income, their seeds and processed competitive and demand in the domestic and global markets. Ukraine - the world leader in the processing and production of sunflower oil, domestic oil and fat industry shows positive dynamics of production and development even during the crisis.

Keywords: oil and fat industry, oilseeds, production dynamics, correlation coefficient pair

JEL classification: *Q10, Q13, Q17*

1. Introduction

Domestic oil and fat industry is one of the most advanced and promising segments of the food sector of Ukrainian economy. In recent years there has been steady increase in production of major oil and fat products. The main factor of the increase in output is the growth in world consumption of oil and fat products and the associated significant increase in its exports by domestic producers. In its turn, the main reasons for increase in demand are: reorientation in the structure of nutrition for preferential use of vegetable oils and fats because of their physiological superiority and more affordable prices compared to animal fats and increased use of vegetable oils in technical purposes, production of detergents, lubricants and especially biodiesel.

These issues are important and require in-depth research and scientific support

2. Data and Methods

The purpose of the article is to evaluate variations of dynamics of productivity of oilseeds and identify the main trends of development of the market of oilseeds in Ukraine.

The basis of the study is formed by the scientific works of local scientists on the problems of the market of oilseeds in Ukraine and abroad, materials of the Ministry of Agrarian Policy, the Cabinet of Ministers of Ukraine, the State Statistics Service, US Department of Agriculture (USDA) with using monographic (the study of the causes of low productivity of oilseeds), statistical and economic (to analyze key indicators of production and sales of oilseeds), abstract and logical (for theoretical generalization of research results and formulation of

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conclusion) and balance (for the calculation of the balance sheet) combination of quantitative and qualitative analysis, and also tabular method of displaying information.

3. Results and Discussion

Production of oilseeds in Ukraine for many years has focused primarily on sunflower as the main raw material for industrial production. Rape is an attractive crop for the market, the demand for which is constantly growing. This crop is the source of green fodder and restoration of soil fertility, excellent raw material for biofuel production. Ukraine the industry of rape-growing and industrial processing has great potential to be implemented through market mechanisms. Soy bean is a valuable plant in terms of agronomy because it enriches the soil with nitrogen, improves its structure. It is in demand among producers of agricultural products as a profitable crop.

Main oil crops in the national agricultural market is the sunflower, whose share in the total production of oilseeds on average over the last three years is 6%. Sunflower is the most profitable among other oilseeds. At the same time, in recent years, the level of profitability of cultivation reduced (from 45,5% in 2012 to 36,5% in 2014) as a result of increased production costs due to the use of expensive seeds and improving the culture of farming [2].

Production of major oilseeds in 2012-2014 increased by 4 214 thousand tons, or 30,1%, due to the increased production of rapeseed to 993,6 thousand tons or 82,5%, of soybean - to 1471,7 thousand tons or 61,1%. The main place in the structure of sown areas of oilseeds is occupied by sunflower - up to 65%. The increase in oilseed sowing on 722 thousand hectares (7,7%) in the last three years was due to the increase in rape crops up to 1 240 thousand hectares (219%) and soybeans up to 63 thousand hectares (1,2%). There should be noted the positive dynamics of yield of oilseeds. Thus, the average sunflower yield increased by 2,9 centner/ha, of rape - by 3,4 centner/ha, of soybean - by 4.5 centner/ha [3,4]. But we can consider as a real achievement the results of the production of soybean, as a significant increase in productivity occurred at the background of a decline of sown areas which indicates the growth of processes of intensification of production of rapeseed in Ukraine (table 1).

Table 1: The structure of sown areas of oilseeds in Ukraine

Crop	Sown area, thousand/ha			Yield, centner/ha			Gross harvest, thousand tons		
	2012 p.	2013 p.	2014*p.	2012 p	2013 p	2014*p	2012 p.	2013 p.	2014*p.
Sunflower	5194	5051	5257	17	22	19	8387	11051	10134
Rape	566	1017	1806	22	24	25	1204	2352	2198
Soybean	1476	1370	882	17	21	22	2410	2774	3882
Total	9248	9451	9959	-	-	-	14014	18190	18228

Source: calculated according to the data of ukrstat.gov.ua (*excluding the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol and excluding the zone of the antiterrorist operation)

The results of analysis of the dynamics of certain oilseeds yield indicate that the most stable oilseed is sunflower (table 2). At the same, during the years of 2000-2014 there can be observed discrepancies of periods of decline and increase of productivity of some crops. In particular, in 2001 compared with 2000 the increase of rapeseed yield was 47,62%, while the yield of sunflower seeds and soybeans fell by 22,95% and 4,72% respectively. In 2004 compared with 2003 the yield of sunflower seeds declined by 20,54%, and the yield of soybeans and rapeseed tended to increase – 16,39% and 47,87% respectively. In 2014

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compared with 2013 the yield of sunflower seeds decreased by 10,6% and the yield of rapeseed and soybeans tended to increase – 8,09% and 5,37% respectively.

Table 2: Dynamics of yield of oilseeds in Ukraine for the years 2000-2014

Indicators	Years															Average value
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Sunflower seeds																
Yield, centner/ha	12,2	9,4	12,0	11,2	8,9	12,8	13,6	12,2	15,3	15,2	15,0	18,4	16,5	21,7	19,4	14,3
Absolute growth (chain), centner/ha	-	-2,8	2,6	-0,8	-2,3	3,9	0,8	-1,4	3,1	-0,1	-0,2	3,4	-1,9	5,2	-2,3	7,2
Growth rate (chain), %	-	-23,0	27,7	-6,7	-20,5	43,8	6,2	-10,3	25,4	-0,7	-1,3	22,7	-10,3	31,5	-10,6	X
Rape seeds																
Yield, centner/ha	8,4	12,4	8,7	9,4	13,9	14,6	15,7	13,1	20,8	18,5	17,0	17,3	22,0	23,5	25,4	16,0
Absolute growth (chain), centner/ha	-	4,0	-3,7	0,7	4,5	0,7	1,1	-2,6	7,7	-2,3	-1,5	0,3	4,7	1,5	1,9	17,0
Growth rate (chain), %	-	47,6	-29,8	8,0	47,9	5,0	7,5	-16,6	58,8	-11,1	-8,1	1,8	27,2	6,8	8,1	X
Soybeans																
Yield, centner/ha	10,6	10,1	12,7	12,2	14,2	14,5	12,4	12,4	15,1	16,8	16,2	20,4	17,1	20,5	21,6	15,1
Absolute growth (chain), centner/ha	-	-0,5	2,6	-0,5	2,0	0,3	-2,1	0,0	2,7	1,7	-0,6	4,2	-3,3	3,4	1,1	11,0
Growth rate (chain), %	-	-4,7	25,7	-3,9	16,4	2,1	-14,5	0,0	21,8	11,3	-3,6	25,9	-16,2	19,9	5,4	X

Source: calculated according to the data of State Statistics Service of Ukraine [1]

The highest average yield for the period of 2000-2014 is observed in rapeseed - 16 centner/ha. The equations of linear trends of oilseeds yield (Fig. 1) shows that the largest average annual increase of productivity from 1 hectare of harvesting area is observed in rapeseed – 1,0925 centner/ha. At the same time, the average annual increase of productivity of soybeans from 1 hectare of harvesting area is at the level of 0,7411 centner/ha; average annual increase of productivity of sunflower seeds from 1 hectare of harvesting area – 0,7154 centner/ha [5,6].

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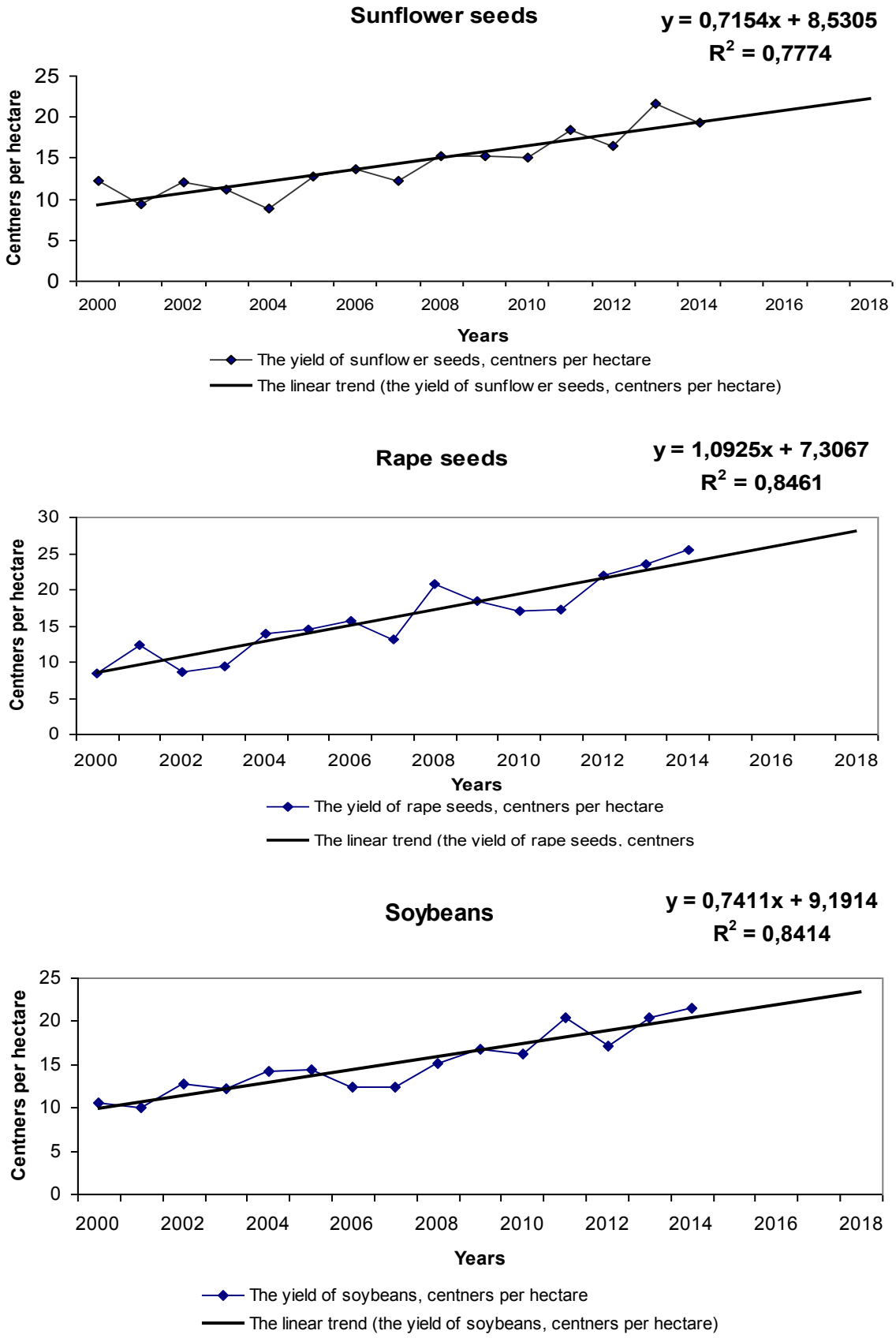
Fig. 1. Dynamics of productivity of the major oilseeds in Ukraine



Source: constructed by the authors according to the data of State Statistics Service of Ukraine [1]

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The yield of some oilseeds and the total sowing area should provide the overall stable and necessary harvest of oilseeds. To study the fluctuations of productivity we will calculate the characteristics of variation of oilseeds yield. For this purpose, we will use the mean square deviation indicator that shows how much in the average the yield of certain oilseeds deviate from their average value. On the basis of primary, not grouped data the mean square deviation is calculated by the formula (1):

$$\delta = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2}, \qquad (1)$$

where x_i – i-й sampling unit;

$\bar{x}$ – the arithmetic mean of the sample $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$;

n – the volume (size) of the sample.

To compare the variation of the various features in one set or of a single feature in several sets with different average value the relative indicators of variation are used - variation coefficients, which are calculated as a ratio of absolute values of the variations to the arithmetic mean and are expressed as a percentage. The value of these coefficients depends on how exactly the absolute characteristics of variation is used. Among the variation coefficients the most commonly used indicator, which is calculated by the mean square deviation (Formula 2):

$$\nu_r = \frac{\delta}{\bar{x}} \qquad (2)$$

The variation is considered weak, if ν_r < 10%, if ν_r from 11–25%, but average and significant at ν_r >25%.

Table 3 shows the general characteristic of variation of oilseeds yield.

Table 3: General characteristic of variation of yield of oilseeds in Ukraine

Indicators	Sunflower seeds	Rape seeds	Soybeans
Mean square deviation, δ	3,51	5,13	3,49
Range of variation, *R*	12,8	17,0	11,5
Variation coefficient, V_r	0,25	0,32	0,23

Source: calculated according to the data of State Statistics Service of Ukraine [1]

It should be noted that the totality is considered homogeneous when the coefficient of variation does not exceed 33%. Based on the obtained values (25,0%, 32,0%, 23,0%) the studied totalities (yield of sunflower seeds, soybeans, rapeseed) meet the condition of homogeneity.

The calculation results in Table 4 show that the variation in the yield of sunflower seeds and soybeans yield is average. The biggest fluctuations in productivity are observed in growing rape (V_r = 0,32 or 32%).

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To determine the synchronicity of fluctuations of yield of sunflower seeds, rapeseed, soybeans, we calculate the coefficients of pair correlation.

The coefficients of pair correlation називають the ratio of the correlation moment to the derivative of the average square deviations (formula 3):

$$r=\frac{\sum_{i=1}^{n}(x_i-\overline{x})\cdot(y_i-\overline{y})}{\sqrt{\sum_{i=1}^{n}(x_i-\overline{x})^2\cdot(y_i-\overline{y})^2}}, \qquad (3)$$

where both x_i , and y_i – the numerical values of the quantities, between which the correlation is set;

$\overline{x}$, $\overline{y}$ – their average arithmetical values of the quantities.

The coefficient of pair correlation does not depend on the count start and units of measure. The negative value (r_{yx}) indicates different directions of yield fluctuations of oilseeds and the positive - on the one-pointedness.

The coefficient of pair correlation is interpreted as follows:

1) at $0 < | r_{yx} | < 0{,}3$ weak nature of changes;

2) at $0{,}3 < | r_{yx} | < 0{,}7$ average nature of changes;

3) at $0{,}7 < | r_{yx} | < 1$ tight nature of changes.

On the basis of the results obtained it is found that the coefficient of the pair correlation, which reflects the level and direction of the fluctuation matches of the yield of sunflower seeds and soybeans yield is 0,89, that proves a rather tight nature of changes.

The coefficient of pair correlation between the variation of the yield of sunflower seeds and rape seeds yield was 0,82, that proves close relation between the yield of the studied crops.

The coefficient of pair correlation between the variation of the yield of soybeans and rape seeds yield was 0,84, that proves close relation between the yield of the studied crops.

Thus, the calculated coefficients of pair correlation indicate unidirectionality of fluctuations of yield of investigated oilseeds, confirming the identical response to the climatic conditions of the formation of yield of the studied oilseeds.

With the increased production of major oilseeds, the power of their processing also grows and the infrastructure of the market of oilseeds changes accordingly. An important modern development trend of this market - it is putting into operation the universal processing plants not only for sunflower seeds, but also soybean, rapeseed. The decisive in placing the enterprises of fat and oil complex is a raw material factor, which is associated with high material intensity of a unity of the final product, as cultivation of oilseeds in Ukraine is located unevenly. The main part of cultivated areas is concentrated in eight regions: Dnipropetrovsk, Donetsk, Zaporizhia, Luhansk, Mykolaiv, Odesa, Kharkiv. It is there where major production capacities are located [7].

Research has established that a characteristic feature of modern agricultural market is the integration processes. Large companies, manufacturers of raw materials at the market of

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oilseeds of Ukraine, continue increasing own production and processing capacities. Ukrainian oil and fat industry is represented by companies that are affiliated with "Ukroliyaprom" as well as big companies CJSC "Cargill", LLC "Toepfer" SE "Suntrade", PF "KMT", "Bunge", "Kernel". All companies work on the basis of large plants. Currently, the sector consists of 17 large enterprises. Existing capacities of oil and fat enterprises of Ukraine allow during the year to process up to 4.5 million tons of oilseeds (usually sunflower and rape), and you can get 1.5 million tons of sunflower oil, 380 thousand tons of margarine, 105 thousand tons of mayonnaise. Substantial representatives and entities of the agricultural market are agricultural holdings. Their emergence in agriculture of Ukraine is a new phenomenon for our country. In agriculture such structures began to be established later than in other industries, not only in Ukraine but also in other countries. Agricultural holdings now combine in a closed cycle all stages of the production process of sunflower with its subsequent processing into oil.

The growth of production of major oilseeds in recent years is due to the development of processing capacities of oil raw materials (especially of sunflower), and the steady demand from European buyers for rapeseed and soybeans. An important tendency of development of processing capacities in Ukraine is the construction of universal plants that process not only sunflower seeds, but also soybeans and rapeseed.

The structure of sowing areas of major oilseeds is changing: the areas under soybean are reduced in favor of the areas of rapeseed, but leadership is reserved for sunflower. The main advantages of sunflower in the agricultural market are stable high demand for the crop, high prices on the domestic market.

Occupying a leading position in the global production of oilseeds, Ukraine has a competitive advantage in the market of oilseeds. However, the current competitiveness of Ukrainian oilseed is determined only by larger volumes and lower prices compared with other countries.

To ensure the competitiveness of oilseeds in the domestic and foreign markets is possible through the growth of yields through the use of highly efficient advanced production technology and increasing volumes of processing of soybeans and rapeseed. Further studies are needed for the questions of the development of a complex of measures to optimize the sown areas through the introduction of crop rotation, improving manufacturability and ecological compatibility of production. Ensuring the increase in the competitiveness of oilseeds in the conditions of Ukraine's associated membership in the European Union.

4. Conclusion

In a market economy for economic entities oilseeds, particularly sunflower seeds, are the reliable source of cash income (in 2014/15 the country's export revenues from corn (3 356 billion dollars) and wheat (2 293 billion dollars) - the leaders of Ukrainian exports in the past - for the first time were lower than revenues from exports of sunflower oil - 4 800 billion dollars).

Revenues from the export of sunflower oil showed the vulnerability of exports of raw materials and economic benefits of processing. In 2014, sunflower oil was the number one export commodity in Ukraine. In order to stay the leading manufacturer of sunflower seeds and oil it is necessary to constantly examine global and national market conjuncture, factors affecting its change, create a favorable investment climate, use and adapt the world experience of regulating the market of sunflower to existing conditions, apply the new technologies of growing.

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The process of structural changes in Iberian Peninsula agriculture

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Abstract
Portuguese and Spanish integration with the EU was a constructive step on the road to modern, well-developed economy. Last 30 years can be described as a success in changing structure of agriculture, but primary sector is still a crucial one in mention above countries and it's modernization seems to be a top priority for them. Especially in time of the current Global Financial Crisis. Poland and other member states from Central and Eastern Europe can learn much from the case of Spain and Portugal because their situation today is comparable to these countries situation 30 years ago. Similarly, Poland and it's neighbours has a huge amount of unsolved problems in primary sector and try to solve them with community structural aid. Large part of lands located in studied area is characterized by a low level of development and dependence of production in the first sector. The rapid pace of growth limits a traditional employment structure in which agriculture plays a very important role. The results of investigation are presenting that last thirty years have brought positive changes manifested in evolution of employment and participation structure in Mediterranean countries. In spite of substantial dynamics of positive changes and the three decades passage during integration of the countries analysed, the situation is still complicated. The low level of economic development, structural problems, dramatic situation of public finances and the labour market, resulting from the global financial crisis, cause that those countries, without the help of EU would face on edge of a precipice.

Keywords: *agriculture, European Union, Portugal, regions, Spain*

JEL Classification: *R11, Q10, Q14*

1. Introduction

The article presents evolution of employment structure and production in Portuguese and Spanish agriculture for the last three decades. The countries with symbol 'NTS 1' in nomenclature of the European Union were analysed. Transformations in agriculture of the Mediterranean Sea region are interesting especially, because in those countries the integration process and development of the EU within the common market began with the structural metamorphosis in the first sector, which are being experienced by Poland currently. Those changes indicates the possible direction that will await the Polish agriculture during the next years.

The issues undertaken in the presented research from a global perspective is new. Earlier authors understood it from different perspectives, for example by using a reallocation model of economic labor resources between agriculture, manufacturing and services in Portugal (Restuccia 2006). On the basis of strategic concepts the role of agricultural production in developing economies was depicted (Vogel 1994). Also the problem of capital transfer was studied from agriculture to other Spanish economy sectors (Prados De La Escosura 2007).

2. The research methodology

The changes occurring in the employment structure and value added participation of agriculture in the European Union Member States economy, evoke considerable interest among the

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countries, joined the group in the XXI century. In Poland, with special interest the changes which took place in this field are analysed in Mediterranean countries of Spain and Portugal. Investigating the situation of first 15 EU member states, it can be concluded that experiences of those countries can be used as a base for new Member States. The similarities arise not only from analogous agricultural problems of the Mediterranean countries in the first period, after the integration with EU during 80s of last century and ours nowadays. It has a deeper character, which raises presumption that changes taking place in that area may provide for us a field of reflection. Mentioned similarities, next to the situation of agriculture, also apply to the specific conditions of post-war development, moving away from dictatorship and transition to democratic system, or close economic problems. The costs that those countries bore on the way to adapt requirements of the common market and the benefits achieved during the last three decades are considered. Analysis of changes taking place in the member states of group is important especially today, at time of the biggest economic recession. Dramatic economic and social situation in which are countries of the Iberian Peninsula, suggests that structural reforms undertaken in recent years had only temporary character and did not prevent effects of the economic crisis.

The aim of article is to present an aspect of the structural changes that have taken place in Spain and Portugal during the past three decades - the evolution of employment and the share of agriculture in national product.

The study is based on the national publications and reports of the European Commission. In this paper the statistical data from Eurostat, the Spanish and the Portuguese Institute of Statistics (INE), the OECD and the ILO were used. Chronological range covers the years 1981-2013.

3. Results and Discussion

One of the important information resource about the changes that take place over the years in agriculture is analysis of the employment evolution structure and primary sector participation in the product value produced in country. The development of domestic employment and production structure is an important source of information about both the socio - economic situation as well as the dynamics and direction in which country follows. In the 70s, before the integration of three analysed countries with the EU has shown a tendency of changes in employment level with various sectors of the economy, as well as their importance in the overall economy. This process has accelerated rapidly in order to the necessity of adapting those economies to increasing competition on a global scale, the conditions of common market functioning or obtaining structural funds.

Table1: The sectoral structure of Spanish GDP during the 1981 – 2013 years (%)

Specification	1981	1986	1990	1995	2000	2005	2010	2013
Agriculture, hunting, forestry, fishing	6,3	5,9	5,5	4,5	4,4	3,2	2,7	2,6
Services	57,9	59,8	61,4	66,1	66,4	67,1	71,6	72,1
Industry	28,5	27,8	24,4	21,9	20,9	18,2	16,6	17,5
Construction	7,3	6,4	8,6	7,5	8,3	11,5	10,1	7,8

[1)] As a percentage of gross value added, generated in the economy

Source: OECD, OECD Factbook 2008: Economic, Environmental and Social Statistics, OECD Publishing, 2008 Paris, OECD, OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing, 2016 Paris, International Labour Organization, ILOSTAT, EUROSTAT, European Commission, Directorate

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General for Economic and Financial Affairs, Statistical Annex of European Economy, Autumn 2015, European Commission's DG ECFIN database AMECO, Eurostat, own calculations.

Back in 1981, the part of primary sector in produced national income of Spain was high at over 6%. This agriculture share degree in the manufactured income differs from levels seen in the rest of group. As a result of dynamic changes occurring in Spanish economy such as the growing competitiveness and investment attractiveness the meaning of agricultural production steadily decreased (OECD 2009). Finally, by 2013 the share of the first sector decreased by half to 2.6%. Not only agriculture has undergone structural changes of pressure. The second sector which did not avoid the necessity of restructuring and in the effect decline in GDP, was industry. The share of this sector in generated product has decreased over the last twenty years by almost half, reaching 17.5% in 2013 (Table 1).

It should be noted that a crack of speculative bubble in a property market which is the direct cause of the economic recession in the country reduced the construction share level in the manufactured product of Spain, which since the middle of the first twenty-first decade century functioned as flywheel of the Spanish economy.

Parallel to decrease in part of agriculture and industry in generated product of Spain, the importance of the services sector was growing. This trend, which is characteristic for fast-growing countries confirms the positive changes that have taken place in the economy of Spain since the middle 80s.

Table 2: The sectoral structure of employment in Spain during the 1981 – 2013 years (%)

Specification	1981	1986	1990	1995	2000	2005	2010	2013
Agriculture, hunting, forestry, fishing	18,8	18,2	11,7	9,2	6,6	5,3	4,3	4,3
Services	46,0	50,3	55,1	60,7	62,4	62,3	72,6	75,9
Industry + construction	35,2	31,5	33,1	30,0	31,0	28,5	23,1	19,8

Source: OECD, OECD Factbook 2008: Economic, Environmental and Social Statistics, OECD Publishing, 2008 Paris, OECD, OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing, 2016 Paris, International Labour Organization, ILOSTAT, EUROSTAT, European Commission, Directorate General for Economic and Financial Affairs, Statistical Annex of European Economy, Autumn 2015, European Commission's DG ECFIN database AMECO, Eurostat, International Labour Organization, KILM 9th Edition, 2015, own calculations.

Three decades of functioning within the European economy brought significant changes in employment structure. Spain, acceding to the European Union in the mid-80s was marked by the traditional economic structure, typical for countries with a low level of development. During the last years, the amount of employment in individual sectors of economy came to a degree which can be observed in developed countries (Table 2). Along with a smaller share of the first sector in produced country's GDP, increasing labour productivity and technological advancement, the working interest has reduced rapidly (employment decreased from 18.8% in 1981 to 4.3% of the total working population in 2013). Similar changes were made also in the number of people working in industry and construction (from 35% to 19.8% of the workforce). However, according to the trends observed in most developed countries the employment in Spanish service sector has increased meaningfully, from 46% in 1986 to almost 76% in 2013. (Institututo Nacional de Estadistica 2009).

About dynamics of changes in the Portuguese economy, it is evidenced by the evolution of the sectoral structure of GDP last quarter-century (Table 3). Undoubtedly, the sector in which changes were the biggest was agriculture. At the beginning of eighties the part of first sector in

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national income has represented more than 16%, while to 2013 it decreased more than fivefold to 2.4% for the whole economy. Also important changes occurred in the service sector. Its share in GDP, produced in Portugal, has increased over the last thirty years by 15.5 percentage points, reaching in 2013 the value of 74.4%. On the other hand the changes taking place in different two sectors - industry and construction - were, as in other developing countries much milder.

Table 3: The sectoral structure of Portuguese GDP during the years 1981 - 2013 years (%)

Specification	1981	1986	1990	1995	2000	2005	2010	2013
Agriculture, hunting, forestry, fishing	16,0	14,1	8,3	5,5	3,6	2,5	2,4	2,4
Services	59,1	59,6	65,4	65,7	69,2	73,1	74,6	74,4
Industry	21,3	22,6	21,4	22,4	19,5	18,0	17,0	18,9
Construction	6,4	5,0	5,5	6,5	7,8	6,5	6,0	4,3

[1)] As a percentage of gross value added, generated in the economy

Source: INE, Anuario Estatistica de Portugal, Lisboa 1982, 1988, 1992, 1997, 2003, INE, Estatísticas do Emprego 2008, Lisboa, 4ş trimestre de 2008, OECD, OECD Factbook 2010: Economic, Environmental and Social Statistics, OECD Publishing 2010, OECD, OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing 2016, INE, Anuario Estatistica de Portugal, Lisboa 1982, 1988, 1992, 1997, 2003, INE, Estatísticas do Emprego 2008, Lisboa, 4ş trimestre de 2008, own calculations.

Along with changes in the sectoral structure of the Portuguese economy, the significant changes in employment structure have been shown for last few years. It should be added that despite more than 25 years of functioning within the common market, the sectoral structure of employment in Portugal is deviating from levels that can be observed in Western Europe. It is true that the employment in agricultural sector had been reduced with over 26% in 1981 to 10.2% of the total working population in 2013 (Table 4). However, it exceeds the analogous ratios observed in most euro area countries. Portugal in spite of nearly three decades in the EU is still poorly developed country. As a result of limited structural reforms, peripherial location and the considerable role that play there traditional industry, Portugal with Greece is the least developed country among of first 15 EU members.

Table 4: The sectoral structure of employment in Portugal, during the 1981 - 2013 years (%)

Specification	1981	1986	1990	1995	2000	2005	2010	2013
Agriculture, hunting, forestry, fishing	26,1	21,9	17,8	12,2	12,9	11,6	10,9	10,2
Services	37,4	44	47,2	56,5	53	57,8	61,4	63,1
Industry + construction	36,5	34,1	34,9	31,3	34,1	30,5	27,7	23,7

Source: INE, Anuario Estatistica de Portugal, Lisboa 1982, 1988, 1992, 1997, 2003, INE, Estatísticas do Emprego 2008, Lisboa, 4ş trimestre de 2008, OECD, OECD Factbook 2010: Economic, Environmental and Social Statistics, OECD Publishing 2010, OECD, OECD Factbook 2015-2016: Economic, Environmental and Social Statistics, OECD Publishing 2016, INE, Anuario Estatistica de Portugal, Lisboa 1982, 1988, 1992, 1997, 2003, INE, Estatísticas do Emprego 2008, Lisboa, 4ş trimestre de 2008, International Labour Organization, KILM 9th Edition, 2015, own calculations.

Between 1981 and 2013 the number of people working in industry and construction were decreased relevantly (with 36.5% to 23.7% of the workforce). According to trends observed in those countries that are moving towards with reduction of the development gaps separating them from the economies of Western Europe, the employment increased in the service sector

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to the greatest extent. It can be said that this growth was impressive because it was 24 percentage points (from 37.4% in 1986 to 63.1% in 2013). However, the level of employment achieved in 2013 of the services sector, forming above 63% was considerably lower than the degree seen in most European Union countries. Nevertheless, it is expected that next years will bring a further increase of employment in services, especially towards fact that traditional sectors of economy, which for years were forming the basis of the Portuguese economy are against the fierce competition of products from Asian countries today and pressure connected with the global financial crisis. Growing competition will lead to a reduction of employment in footwear and textile industries. People, losing the employment, will most likely find work in developing services.

4. Conclusions

The integration of Spain and Portugal with the EU structures in 1986 forced the need to adapt the economies of these countries to operating in a much more competitive environment. The presence at the common market and financial assistance under the Common Agricultural Policy and structural policies, has allowed those countries go through this process painlessly. Financial support accelerated economic development of Spain and Portugal. The need of adaptation economy to a highly competitive single market has led to structural changes in local agriculture. However, despite the huge influx of funds, a large part of lands located near Mediterranean Sea is characterized by a low level of development and dependence of production in the first sector. The rapid pace of growth limits a traditional employment structure in which agriculture plays a very important role. The dramatic consequences of current financial crisis cause that in analyzed countries, employment in agriculture is actually increasing during recent years. People losing the jobs in other sectors return again to rural areas, trying to find work in agricultural production.

It should be emphasized that in all investigated countries the last thirty years have brought positive changes manifested in evolution of employment and participation structure. Since the early 80s of the last century in Spain and Portugal the employment in agriculture has reduced markedly, while it increased in the services sector. The decline in first sector is accompanied by an increase in efficiency of agricultural production.

In spite of substantial dynamics of positive changes and the three decades passage during integration of the countries analyzed, the situation is still complicated. The low level of economic development, structural problems, dramatic situation of public finances and the labour market, resulting from the global financial crisis, cause that those countries, without the help of EU would face on edge of a precipice. Meanwhile, the last three of EU enlargements to the countries of Central and Eastern Europe brought shift in focus on supporting the development of the new Member States. Studied in the article states are still heavily dependent on agricultural production. Long distance from the most important economic markets creates enormous barriers for use of endogenous potential situated in local communities.

Before the way Spain and Portugal had gone through in the 80s and 90s, stands today the Central European agriculture. Likewise, as analyzed in the article countries, the states in this part of Europe joined the EU with a number of first sector unresolved problems.

Furthermore they hit on period of the greatest economic crisis, which in recent decades affected the Western world. The next few years should answer the question whether the structural changes in agriculture will bring those countries a dynamic economic growth, despite the global perturbations that make these changes even more complicated.

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Foreign trade with agricultural products in the Slovak Republic

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Abstract
The article analyses trends in territorial and commodity structure of the Slovak foreign agrarian trade. The aim of this paper is to analyze development of trade and competitiveness of agricultural commodities groups.
The article analyses trade in period from the year 2004 to 2014 (period after EU accession). There is possibility to use different indicators by examining competitiveness of chosen agricultural products groups. To analyse an average growth rate of export and import within individual time series was used the geometric mean.
To identify comparative advantages are used: RCA index (Revealed comparative advantage index) and its modifications RCA 1, RCA 2 and Grubel-Loyd index (GLI index) and Lafay Index (LFI).
The results show that the value of agricultural exports and imports was growing during the analyzed period while the growth rate of agricultural exports was below the growth rate of agricultural imports. Agricultural exports increased from Euro 1,142 billion in 2004 to more than Euro 2,749 billion in 2014 and imports rose from Euro 1,663 billion to more than Euro 3,787 billion in the same period. The Slovak Republic reached negative trade balance with agricultural products during analysed period. Slovakia is mostly trading with the countries of the EU 28 (mostly Czech Republic, Poland, Hungary and Germany). From the point of commodity structure, Slovakia is exporting mostly these agricultural product groups HS04, HS10, HS17 and HS12. On other side Slovakia is importing following groups HS02, HS04, HS22 and HS 21

Keywords: *foreign trade, agricultural products, export, import, comparative advantage*

JEL Classification: *Q17*

1. Introduction

The last 20 years affected agricultural sector in many European countries including the members of the Visegrad Group. The volume of their agricultural production was significantly reduced, but the volume and value of their trade activities had been constantly growing (Bielik et al. 2010).
Agrarian trade of the Czech Republic and Slovakia has undergone very significant changes in the period since the break-up of Czechoslovakia up to the present, which have influenced its commodity and territorial structure. The process of dividing the state, building a new business structure and the EU accession influenced the current form of Czech and Slovak agricultural trade and also particularly the competitiveness of Czech and Slovak agricultural and foodstuff products in relation to the EU market and also in relation to the world market. The process of transformation of agricultural production and trade in both countries has also affected their relationships. For this reason, the primary objective of this paper is to highlight the changes that

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have occurred in relation to the Czech and Slovak agricultural trade performance development - and in particular the changes in the mutual export and import operations are analysed. During the period 1994-2010, agricultural exports from the Czech Republic to Slovakia became considerably more dynamic than those in the opposite direction. Czech agricultural and foodstuff products have gradually established themselves and have gained comparative advantages over Slovak agrarian production. As a result of this development, a gradual increase of the negative balance of Slovak agricultural trade has occurred in relation to the Czech Republic. Since the Slovak agrarian sector has in recent years significantly decreased its own production capacity, in the future a continuation of the current trend can be expected. (Bielik et al. 2013)
The Slovak foreign agri-food trade has had an unsuitable development during the last years. The decreasing negative balance is presenting a threat in connection with the competitive commodities, which we can produce in the domestic agrarian market (Récky – Hambálková 2014).

2. Data and Methods

Materials and Methods

The aim of the article is to analyse trends in territorial and commodity structure of the Slovak foreign agrarian trade and to identify changes which have occurred during the last decade. The main emphasis has been put on the period after accession to the EU. Primarily such changes are identified, that occurred in relation to the EU-Member States and to third countries.

The article is based on data of the Eurostat. Analysed time series covers the period 2004 – 2014, focused on territorial and commodity structure of the Slovak agricultural trade. The surveyed period was chosen due to the fact, that the Slovak Republic was not an EU-Member State early 2014 and has joined the EU on 1st May.
An analysis of the commodity structure is based on the international tariff nomenclature for the classification of product HS2. This system enables to classify commodity structures of the agricultural trade into 24 aggregations:

Table 1 Commodity structure of the Slovak agricultural trade

HS	Commodity
01	Live animals
02	Meat and edible meat offal
03	Fish and crustaceans, molluscs and other aquatic invertebrates.
04	Dairy produce; birds' eggs; natural honey
05	Products of animal origin, not elsewhere specified or included
06	Live trees and other plants
07	Edible vegetables and certain roots and tubers
08	Edible fruit and nuts
09	Coffee, tea, maté and spices
10	Cereals
11	Products of the milling industry; malt; starches; inulin; wheat gluten
12	Oil seeds and oleaginous fruits
13	Lac; gums, resins and other vegetable saps and extracts
14	Vegetable plaiting materials
15	Animal or vegetable fats and oils and their cleavage products
16	Preparations of meat, of fish or of crustaceans and others.
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations

19	Preparations of cereals
20	Preparations of vegetables and fruit
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar
23	Residues and waste from the food industries, animal fodder
24	Tobacco and manufactured tobacco substitutes

Source: Eurostat, 2014

To analyse an average growth rate within individual time series, the geometric mean of individual chain indices is used to sum the development trend for the whole surveyed period. Based on their averaging through the geometric mean, we can get the an average growth/decline in export or import value for the whole surveyed period. An advantage of the geometric mean is the fact that it considers both positive and negative increments. The calculation of the geometrical mean (%):

$$G = \sqrt[n]{x_1 x_2 \cdots x_n}$$

The article evaluates also comparative advantages of the Slovak agricultural trade. To identify comparative advantages, the RCA12, RCA 2, Grubel Loyd (GLI) and Lafay Index (LFI) is used (LFI index – Lafay, 1992).

The revealed comparative advantage is an index used in international economics for calculating the relative advantage or disadvantage of a certain country in a certain class of goods or services as evidenced by trade flows. It is based on the Ricardian comparative advantage concept.
It most commonly refers to an index introduced by Béla Balassa (1965):

$$RCA1 = (Xij / Xit) / (Xnj / Xnt) = (Xij / Xnj) / (Xit / Xnt)$$

where X represents exports, i is a country, j is a commodity (or industry), t is a set of commodities (or industries) and n is a set of countries. RCA1 measures a country's exports of a commodity (or industry) relative to its total exports and to the corresponding exports of a set of countries.
A comparative advantage is "revealed", if RCA1 >1. If RCA1 is less than unity, the country is said to have a comparative disadvantage in the commodity / industry.
An alternative RCA index is computed in order to make reference to the "own"country trade performance only. This type of measurement of a country's RCA recognizes the possibility of simultaneous exports and imports within a particular commodity / industry.

$$RCA2 = (Xij - Mij) / (Xij + Mij)$$

In the case of Equation , the index ratio ranges from -1 (Xij = 0 and revealed comparative disadvantage) to +1 (Mij = 0 and revealed comparative advantage). However, regarding RCA2, there exist ambiguities around zero values (Greenaway and Milner, 1993).
The Grubel–Lloyd index measures intra-industry trade of a particular product. It was introduced by Herb Grubel and Peter Lloyd in 1971.

$$GLI = ((Xij + Mij) - |Xij-Mij|) / (Xij + Mij)$$

Values are from 0 to 1
If GLi = 1, there is only intra-industry trade, no inter-industry trade. Conversely, if GLi = 0, there is no intra-industry trade, only inter-industry trade.

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$$LFI^{i}_{j} = 100\left(\frac{x^{i}_{j} - m^{i}_{j}}{x^{i}_{j} + m^{i}_{j}} - \frac{\sum_{j=1}^{N}\left(x^{i}_{j} - m^{i}_{j}\right)}{\sum_{j=1}^{N}\left(x^{i}_{j} + m^{i}_{j}\right)}\right)\frac{x^{i}_{j} + m^{i}_{j}}{\sum_{j=1}^{N}\left(x^{i}_{j} + m^{i}_{j}\right)}$$

x^{i}_{j} a m^{i}_{j} represent exports and imports of the product „j" realized by a „i" in relation to a selected trade partner . „N" is the number of analysed items. A positive value of the LFI indicates an existence of a comparative advantage within the analysed trading aggregation. The higher the index value, the higher the level of specialisation of the given country in trade in the given item or group of items. On the other hand, a negative value of the LFI announce an absence of specialisation and comparative advantage (Smutka, Belová, 2011).

3. Results and Discussion

Summarizing the development of the agricultural trade after the accession of the Slovak Republic to the EU, a positive and also negative trends can be seen. Agricultural exports increased more than doubled - from Euro 1 214.66 million in 2005 to more than Euro 2 749.23 million in 2014; imports also grew significantly from Euro 1 663.25 million to more than Euro 3 779.37 million in the same period. From the table 1 we can see, that the total turnover increased by 3 612.45 million Euro. Although the value of the Slovak agricultural trade grows very quickly, it is worth noting that agricultural trade represents only a marginal share of the total trade of the Slovak Republic. Higher dynamics in agricultural trade is mainly due to higher growth in prices of agricultural and food products, and by changing structure of the Slovak agricultural export with a higher proportion of semi-processed and finalized products.

Table 2 Development of the main trade indicators in the period 2004-2014 (in million Euro)

	2004	2005	2006	2007	2008	2009	Index 2009/2004
Export	1142.55	1214.66	1497.96	1800.43	1970.94	1945.07	1.70
Import	1663.25	1756.26	1928.59	2464.95	2852.78	2839.45	1.71
Difference	-520.70	-541.60	-430.64	-664.52	-881.84	-894.38	1.72
Turnover	2805.80	2970.92	3426.55	4265.37	4823.72	4784.51	1.71
	2010	**2011**	**2012**	**2013**	**2014**		**Index 2014/2004**
Export	2175.13	2935.32	3607.01	3219.88	2749.23		2.41
Import	3165.52	3780.17	4016.73	3946.36	3835.94		2.31
Difference	-990.38	-844.85	-409.72	-726.47	-1086.71		2.09
Turnover	5340.65	6715.50	7623.74	7166.24	6585.17		2.35

Source: Eurostat and own calculations 2016

Negative trend is seen in the development of trade balance. From the table 2 we can see that in all analysed years the Slovak republic reached negative value. The development of the trade balance is represented in the figure 1. The value of the turnover is increasing every year (except the year 2014) and it increased by index 2.35.

The average annual growth rate of agricultural exports reached the level about 10.20 %, while the average annual growth rate of agricultural imports stood at 9.11%. It is worth to stress that the share of negative balance in the total value of foreign trade turnover is partly reducing – from the maximum of about 18.56% (in 2004) to 16.50% at the year 2014.

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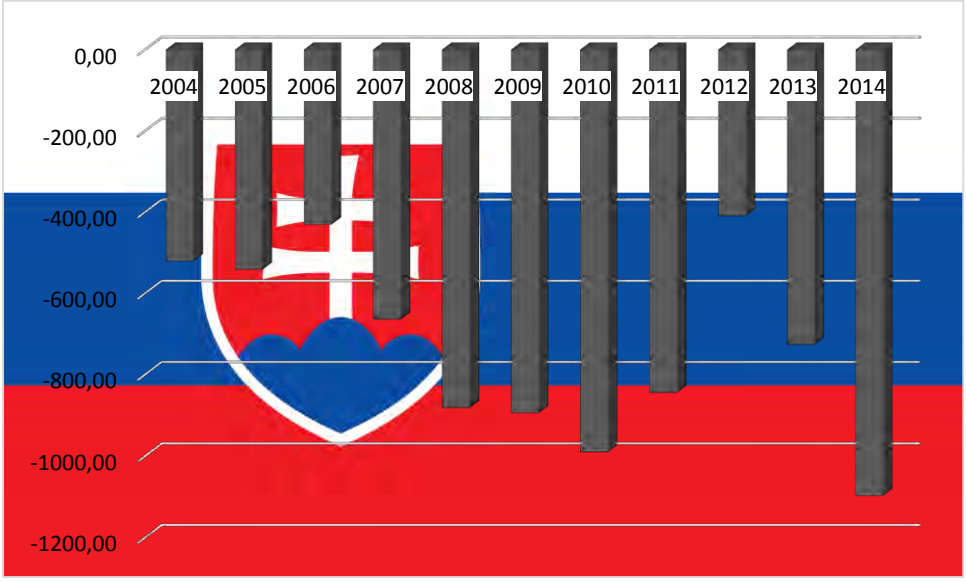
Figure 1 Development of the trade balance in the period 2004-2014 (in million Euro)



Source: Eurostat and own calculations 2016

The territorial structure of the Slovak agricultural trade is many years almost same. Most of exports and imports are realized with the EU 28 countries. The share of the EU as the most important partner is currently about 97 %. This fact also means strong Slovakian dependence on the European Union; in 2005, this share reached already 96 %. . Slovakia is mostly trading with the countries as Czech Republic, Poland, Hungary and Germany.

Trends in commodity structure of the Slovak agricultural foreign trade

The commodity structure of the Slovak agricultural trade has been developing very dynamically in recent years. The most important agricultural export aggregations are following: HS04 (Dairy produce; birds' eggs; natural honey), HS10 (Cereals), HS17 (Sugars and sugar confectionery) and HS12 (Oil seeds and oleaginous fruits). On other side the most important agricultural import aggregations are: HS02 (Meat and edible meat offal), HS04 (Dairy produce; birds' eggs; natural honey), HS22 (Beverages, spirits and vinegar) and HS21 (Miscellaneous edible preparations).

Table 3 Commodity structure of the Slovak agricultural exports and import in the period 2005-2014 (in million Euro)

	Export					Import				
Year	2005	2008	2011	2014	Average annual growth	2005	2008	2011	2014	Average annual growth
HS01	67.72	93.13	165.43	203.30	1.14	35.81	58.46	75.44	72.16	1.13
HS02	82.75	85.35	130.20	130.13	1.10	174.57	263.16	393.04	371.61	1.10
HS03	4.46	4.97	11.81	16.42	1.58	24.93	28.29	37.92	56.75	1.12
HS04	190.42	296.86	270.75	309.81	1.07	129.53	217.20	288.61	338.56	1.12
HS05	9.48	12.00	9.71	18.65	1.12	14.45	18.95	19.62	21.82	1.06
HS06	3.75	5.36	10.69	14.42	1.18	22.32	37.14	54.80	53.11	1.11
HS07	31.77	46.88	31.86	31.24	1.02	70.02	148.16	194.06	191.49	1.13
HS08	70.49	75.52	62.01	70.85	1.01	154.50	225.20	218.41	261.94	1.06
HS09	6.09	69.51	141.66	115.35	1.54	27.92	98.01	189.66	182.44	1.26
HS10	83.57	161.65	299.70	288.58	1.21	32.96	139.87	154.65	89.29	1.21
HS11	68.40	137.40	130.77	116.32	1.09	7.44	33.44	41.50	34.29	1.25
HS12	54.87	156.37	346.11	194.28	1.24	37.06	47.76	136.93	94.28	1.19

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HS13	0.31	0.84	0.82	0.84	1.18	3.91	7.02	8.20	12.18	1.15
HS14	0.13	0.24	0.50	0.10	1.07	0.99	1.01	1.09	1.00	1.12
HS15	46.08	47.29	167.18	156.53	1.27	65.33	164.80	267.67	245.00	1.20
HS16	24.99	43.57	54.21	81.58	1.15	69.73	117.33	159.58	178.52	1.12
HS17	127.07	161.22	377.90	255.46	1.13	72.99	123.28	233.22	131.61	1.10
HS18	103.03	134.64	178.90	182.78	1.08	120.62	141.79	161.65	221.57	1.08
HS19	54.50	84.94	88.91	106.53	1.08	102.59	173.23	226.59	235.88	1.10
HS20	21.06	42.27	53.44	42.58	1.10	81.56	126.47	136.87	147.33	1.07
HS21	73.81	108.06	132.95	138.94	1.08	126.36	192.69	232.01	257.33	1.08
HS22	60.88	150.07	181.59	151.76	1.16	138.93	270.68	299.09	330.24	1.11
HS23	22.30	51.21	78.06	108.68	1.21	99.71	148.57	143.97	189.00	1.08
HS24	6.74	1.59	10.15	3.31	1.75	142.03	70.28	105.59	118.54	1.17
Total	**1214.66**	**1970.94**	**2935.32**	**2749.23**	**1.11**	**1756.26**	**2852.78**	**3780.17**	**3835.94**	**1.09**

Source: Eurostat and own calculations 2016

The Slovak Republic has a positive trade balance in relation to commodity aggregations HS01. HS10, HS11, HS12 and HS17. Other commodity aggregations reached negative value of trade balance.

Trends in competitiveness of the Slovak agricultural foreign trade

Competitiveness of the Slovak agricultural export has been developed in long-term horizon. We used following indicators for the competitiveness evaluation: RCA1, RCA2, GLI and LFI indexes. Comparative advantages are achieved in case of aggregations: HS01 (Live animals), HS10 (Cereals), HS11 (Products of the milling industry; malt; starches; inulin; wheat gluten), HS 12 (Oil seeds and oleaginous fruits) and HS 17 (Sugars and sugar confectionery).

Table 4 Competitiveness of the Slovak agricultural foreign trade

Average annual value of Indicators	RCA1	RCA2	GLI	LFI
HS01	1.58	0.36	0.64	1.85
HS02	-0.18	-0.46	0.54	-2.38
HS03	-0.74	-0.64	0.36	-0.40
HS04	0.90	0.04	0.91	1.88
HS05	0.27	-0.27	0.73	-0.06
HS06	-0.95	-0.71	0.29	-0.53
HS07	-0.53	-0.58	0.42	-1.57
HS08	-0.29	-0.50	0.50	-1.89
HS09	0.26	-0.27	0.73	-0.25
HS10	1.63	0.38	0.62	3.08
HS11	2.29	0.61	0.39	1.99
HS12	1.79	0.43	0.57	3.00
HS13	-1.52	-0.82	0.18	-0.10
HS14	-0.41	-0.51	0.49	-0.01
HS15	0.24	-0.28	0.72	-0.56
HS16	-0.17	-0.46	0.54	-1.01
HS17	1.36	0.26	0.74	3.12
HS18	0.79	-0.02	0.94	0.79
HS19	0.06	-0.36	0.64	-1.09
HS20	-0.30	-0.51	0.49	-1.14
HS21	0.25	-0.28	0.72	-0.79
HS22	0.15	-0.32	0.68	-1.28
HS23	-0.07	-0.41	0.59	-1.01
HS24	-2.35	-0.91	0.09	-1.65

Source: Eurostat and own calculations 2016

4. Conclusion

Based on findings concerning the trends in commodity and territorial structure of the Slovak agricultural trade, following conclusions can be stated. The Slovak agricultural trade is developing very dynamically over time. Agricultural exports increased more than doubled - from Euro 1 214.66 million in 2005 to more than Euro 2 749.23 million in 2014; imports also grew significantly from Euro 1 663.25 million to more than Euro 3 779.37 million in the same period. Negative trend is seen in the development of trade balance. The most important agricultural export aggregations are following: HS04 (Dairy produce; birds' eggs; natural honey), HS10 (Cereals), HS17 (Sugars and sugar confectionery) and HS12 (Oil seeds and oleaginous fruits). Comparative advantages are achieved in case of aggregations: HS01 (Live animals), HS10 (Cereals), HS11 (Products of the milling industry; malt; starches; inulin; wheat gluten), HS 12 (Oil seeds and oleaginous fruits) and HS 17 (Sugars and sugar confectionery).

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Are agricultural subsidies causing more harm than good? Evidence from agricultural sector of the Republic of Macedonia

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Abstract
Over the years in the Republic of Macedonia, agricultural subsidies are enlisted as determinant of farm incomes, farm productivity and the overall national agricultural sector evident in her national budgets, grants and aids from the European Union. However, there is yet empirical findings that evaluate the impact of agricultural subsidy on the performance of agricultural sector of the Republic of Macedonia. Therefore, this paper aimed at examining the causal relationship between agricultural subsidy and performance of agricultural sector, using time series data for the study obtained from State Statistical Office and World Bank and analysed using Augmented Dickey Fuller (ADF) and Pairwise Granger Causality Test. Also. We found that though the relationship between subsidies and agricultural development was not significant, subsidies had a negative impact on agricultural productivity. This clearly reflects the inefficiencies of government subsidization policy of the agricultural production.

Keywords: *Agricultural sector, casual relationship, Republic of Macedonia, subsidies*

JEL Classification: *C12, C32, C53, Q14, Q18*

1. Introduction

Beside the relatively small declination of the agricultural contribution to total GDP of the Republic of Macedonia, the breakeven point of less than 10% is not achieved in the last ten years stagnating on same point even there are many supports and financial instruments to achieve the governmental goal, to modernise the agricultural sector. For that reason, especially from the beginning of 2000`s the governmental subsidies and financial aid for agriculture and rural development increased continuously. From EUR 29 million in 1998 to EUR 155 million in 2013 with continuously tendency to keep on yearly the same amount by 2020 (Ministry of Agriculture Forestry and Water Economy [MAFWE], 2014). With this strategy the Macedonian agricultural will require using agricultural inputs more efficiently and utilize more agricultural land, to follow and harmonise with the European Union agricultural policy and make more competitive agricultural sector. Therefore, a simple question arises in authors mind whether: the governmental subsidies on agricultural sector cause benefits and wellbeing or not. The huge amount of government subsidies on agricultural sector either plays the significant role for agricultural development and modern farming or not.

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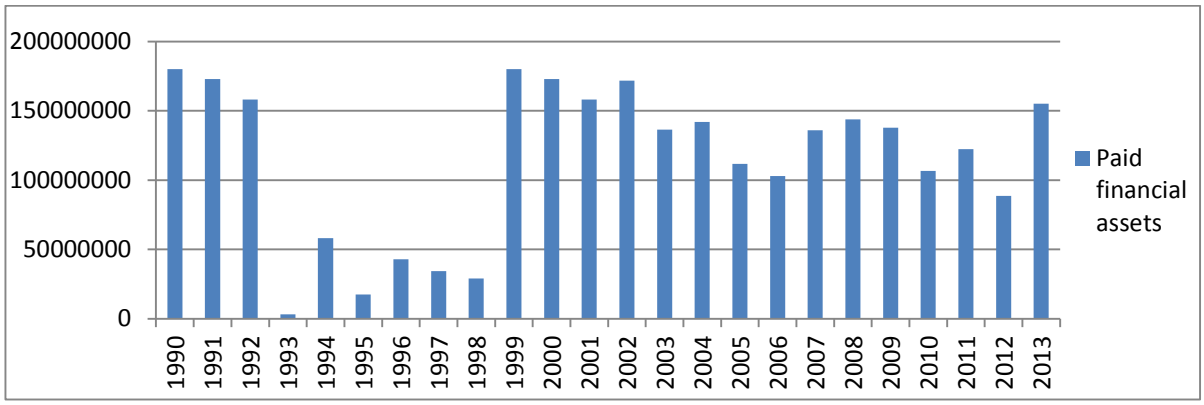
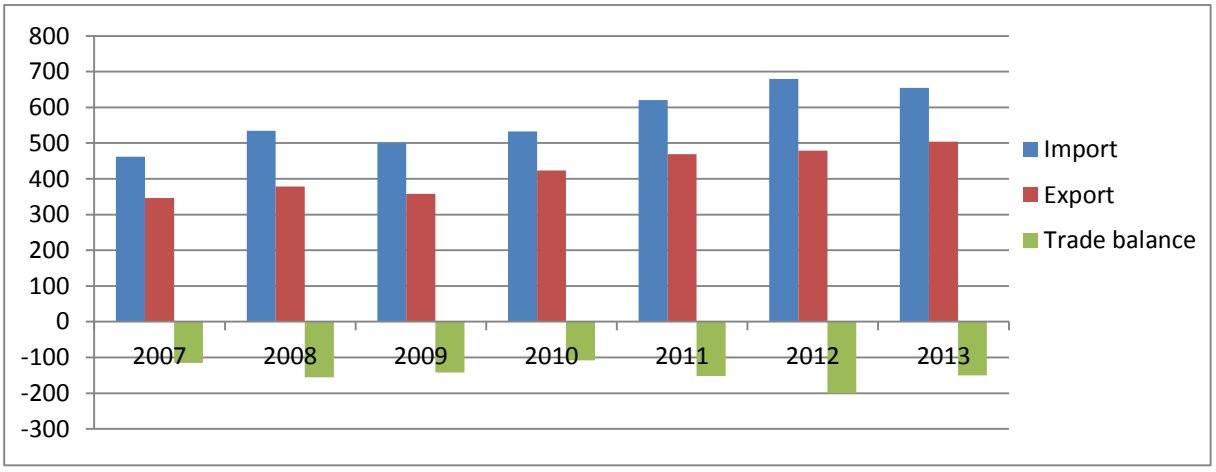
Figure 1. Agricultural subsidies and government financial aid in the agricultural sector in Republic of Macedonia (in EUR million)



Source: World Bank, 2014

Total trade balance of the Macedonian agri-food import-export products showing negative increasing beside the expectations and main goal of the government that subsidy will bring self-sufficient and less dependent food import country. However, vice-versa scenario happened in the last decades after the subsidy programme was announced. The import of agri-food products increased for EUR 193 million between 2007-2013 programme period, followed by extended gap in the trade balance with more than EUR 200 million by 2013.

Figure 2. Import-export of agri-food products in Republic of Macedonia (in EUR million)



Source: SSO and MAFWE, 2014

In the past period one of the key factor for increasing the gap of the Macedonian trade balance is liberation process for tax decreasing by 2008 in previous agreement with World Trade Organisation (WTO) and the Free Trade Agreement with EU from 2011. Also, Central European Free Trade Agreement (CEFTA) from 2006 causes non-tariff agreement in the region to boost the import-export volume of the agri-food sector.

Gross value added (GVA) in Macedonian agricultural sector is generated by 192675 agricultural holdings based on data from the State Statistical Office [SSO] (2007). Out of this, 99% are individual households and only 1% agricultural companies which mean that small-scale farming is crucial factor for the GVA contribution. Nowadays, beside the governmental support and many initiatives the number of individual small-scale farms is decreasing continuously and has 12% less in 2013.

Separately, by subsectors vegetables productions contribute 38.35% of the total GVA, followed by 9% of cereals production and 11% of orchards (MAFWE, 2014). In the analysed period it's

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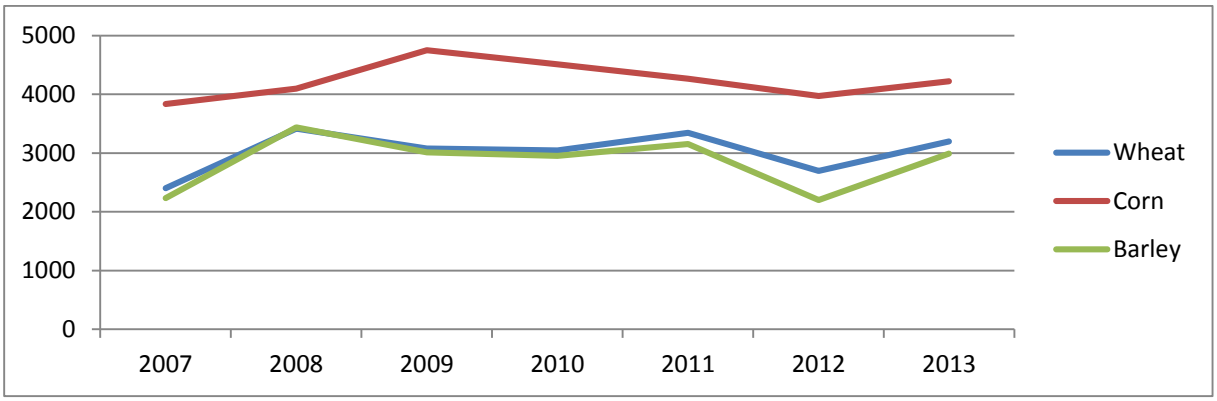
obvious that a cereal production is decreasing which can cause problems on long-term taking into consideration that total cereals production satisfies only 45% of the domestic consumption. Therefore, the need and dependency of cereals import will increase in the following period caused by consumption demand of the population and lower yields per hectare comparing with the region and EU as well.

Figure 3. Average cereal yields in Republic of Macedonia for 2007-2013 (in Kg/ha)

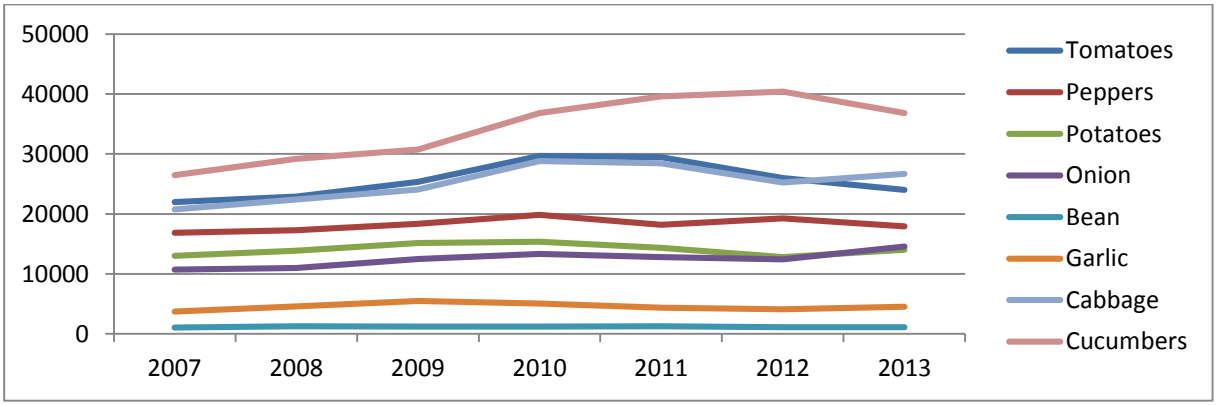


Source: SSO, 2016

Vice-versa of cereal trends, the vegetables sector have significant potential for some products (Figure 4) and might be most significant and export-oriented on a long-term supported by favourable strategy. One more factor for the potential of this sector is the increased total utilized agricultural area (UAA) under vegetables production from 11% in 2008 to 20% in 2012 (MAFWE, 2014). Main progress is achieved in the production of cucumbers and cabbages, which production is encouraged by farmers because of the worthwhile subsidies and strong demand on the post-Soviet market.

In 2007-2013 period vegetables sector was under significant variations caused mainly by: inadequate parity relation between input-output prices (thus farmers were oriented to low cost input production varieties), strong dependence of vegetable sector to climate changes and lack of technological innovations among the existing agri-food processing companies in the country.

Figure 4. Average vegetables yield production in Republic of Macedonia 2007-2013 (in Kg/ha)



Source: SSO, 2016

Except the increased cabbage production per hectare and less significant pepper production, there is no evidence for subsidies` influence for optimized progressive production within the analysed period. Neither significant technological improvement nor total production increasing in the vegetable sector is shown within the analysed period.

Main product among the Macedonian orchards is the apple, which is represented by 45% of the total orchards production, followed by plums 15%, cherries and sour cherries 12% and peaches

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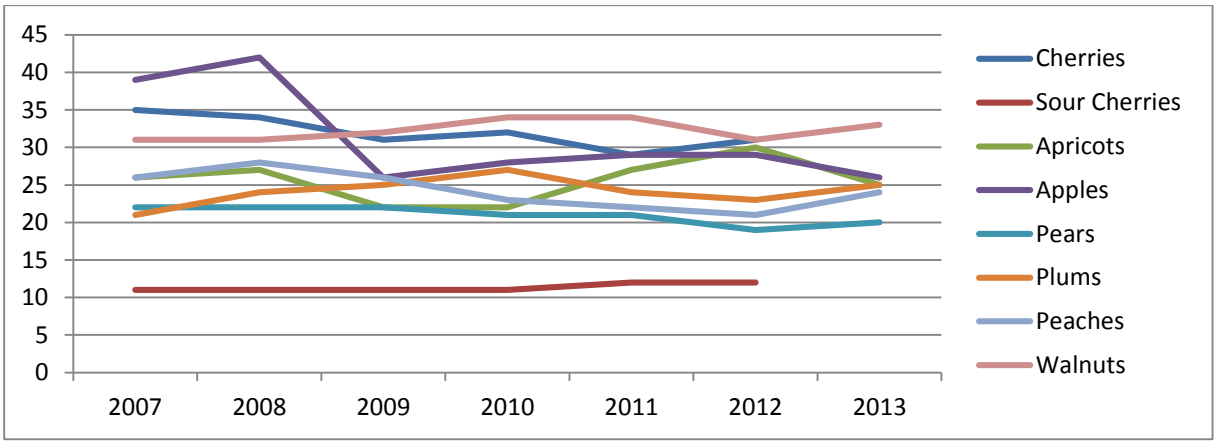
12%. More than 60% of the orchards are with size less than 1 ha which make them less productive and limited in the scope for optimizing and increasing of their productivity. Lack of cooling places and difficult access to micro-credits makes Macedonian orchards production stagnating.

Lack of extension services and increased input price on a long-term make Macedonian fruits less competitive. Climate changes and the demand for new attractive varieties also make Macedonian farmer trapped and limited in their market opportunities. This sector nowadays satisfied Macedonian market in fresh demand, but lack of processing technology make the Republic of Macedonia net importer for added-value fruit products.

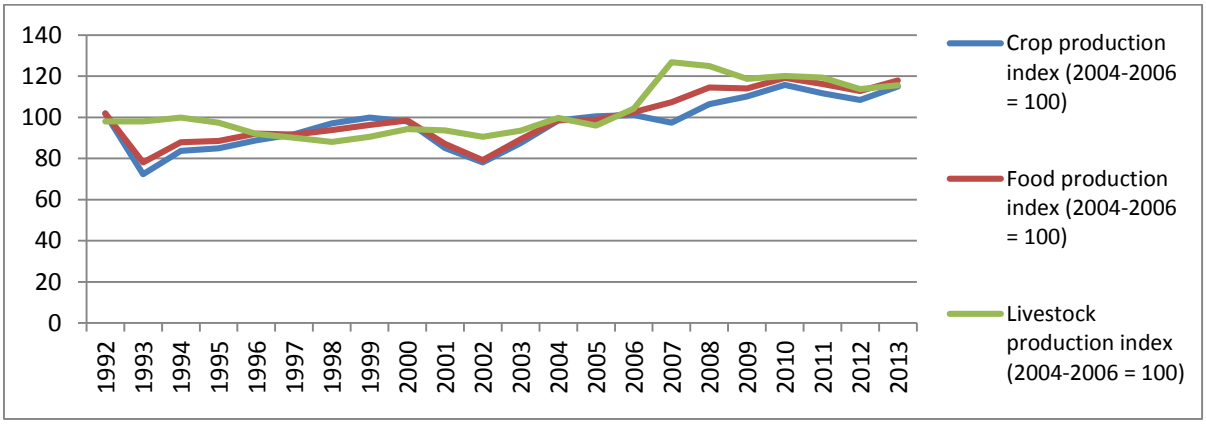
Figure 5. Average orchards production in R. of Macedonia 2007-2013 (in Kg/tree)



Source: SSO, 2016

In summary of the introduction the most important indicators for the agricultural productivity in the Republic of Macedonia (Figure 6) are showing continuous increasing and emergence for different policy and tools to approach to cope with this trends which are emerging in the developing countries. The agri-food indexes shows continuous increase from 2003 onward, time when the country joined WTO and opened its border for competitive and liberal trade, leading to import dependency and losing of agriculture productivity.

Figure 6. Agri-food production index in the Republic of Macedonia



Source: World Bank, 2014

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2. Data and Methods

2.1 Data Sources

The data used in the study was basically from secondary sources, mainly from the State Statistical Office of the Republic of Macedonia and World Bank database over the period of 1990–2014 based on data availability. The publication is designed to serve as an easy reference for statistical information and sources. The dataset provides detailed records on agricultural development, proxied by agricultural production and government subsides.

2.2 Method of Data Analysis

Trend analysis was done using graphs to show the movement of agricultural production and government subsidies with time. Mean, median, minimum, maximum were the various forms of descriptive statistics used to summarize the features of the variables.

It is well known that the usual techniques of regression analysis can result in highly misleading conclusion when variables contains stochastic trend (Stock & Watson (1988), Granger & Newbold (1974)). In particular if the dependent variable and at least one independent variable contain stochastic trend, and if they are not co-integrated, the regression results are spurious (Phillips (1986), Granger & Newbold (1974)). To identify the correct specification of the model, an investigation of the presence of stochastic trend in the variables is needed. The Co-integration Test was used to test if variables share a common stochastic trend and stationary at first differences. Augmented Dickey Fuller (ADF) and Pairwise Granger Causality Test were employed to test for unit root and causality respectively. While the ADF tested for the stationary time series properties of all variables, the Granger Causality Test was used to determine the causal link between the trend of agricultural production and government subsidies in the Republic of Macedonia.

2.2.1 The Augmented Dickey Fuller Model

This study uses the ADF model as presented in Oyinbo & Rekwot (2014):

$$\Delta Yt = a_1 + a_2 t + \beta Y_{t-1} \sum_{i=1}^{n} Yi \, \Delta Y_{t-1} + \varepsilon_t \tag{1}$$

The Hypothesis to test for unit root is stated below:
The null hypothesis H0: $\beta = 0$ shows that the time series data is not stationary.
The alternative hypothesis H1: $\beta < 0$ shows that the time series data is stationary.

2.2.2 The Co-integration Test

The Hypothesis to test for co-integration is stated below:
The null hypothesis H0: $\beta = 0$ shows that there is no co-integration between variables.
The alternative hypothesis H1: $\beta < 0$ shows that there is co-integration between variables.

2.2.3 The Pairwise Granger Causality Test

Model on the causality test between variables is stated below according to Oyinbo & Rekwot (2014). This model was employed in this study to examine the causality relationship that exit between agricultural subsidy and agricultural development proxied by agricultural production value and agricultural raw material export.

$$Xt = \beta_0 \sum_{i=1}^{k} \beta_i X_{t-i} + \sum_{i=1}^{k} \propto_j X_{t-j} + \sigma_{1t} \tag{2}$$

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$$Yt = \gamma_0 \sum_{i=1}^{k} \gamma_i X_{t-i} + \sum_{j=1}^{k} \delta_j X_{t-j} + \sigma_{2t} \quad (3)$$

2.2.4 Regression Analysis for Time Series Data

Regression analysis was employed to examine the effect of agricultural subsidies on agricultural production. The model is specified below:

ΔAGRGI_PRODt = α0 + α1ΔAGRI_SUB + Ut

Where, AGRI_PRODt = Agricultural Production in logarithmic at time t;

AGRI_SUBt = Agricultural subsidies in logarithmic at time t

Δ stands for first difference

The model above was specified in this form in order to prevent spurious regression.

3. Results and Discussion

The Figure 7 below shows a correlating movement between agricultural subsidies, food production index, agricultural production value, agricultural raw material export and average cereals yield. This suggests a possible relation between variables.

Figure 7. Correlation between analysed variables

Source: Authors' Computation, 2016

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3.1 Test for Co-integration

Table 1 below shows the null hypothesis is rejected and the result is interpreted to mean that at least one of the variables are co-integrated, thus the time series data is valid for causality test. This shows that there is long run relationship between agricultural subsidy, agricultural production and agricultural raw material export.

Table 1. Test of Co-integration Results among selected Variables

Variable	ADF Test	t-statistics (1%)	Probability	Inference
Agric_Production	-6.345	-3.769	0.001	1
Agric_Subsidy	-7.074	-3.769	0.000	1
Agric_Export	-4.708	-3.769	0.001	1

Variable ADF Test t-statistics (1%) Probability inference
Source: Author's data analysis 2016

3.2 Granger Causality Test Between Agricultural Subsidies and Agricultural Development Indices

Table 2 below shows the results of the Granger Causality Test among the variables. The result clearly shows that an agricultural subsidy does not granger-cause both agricultural development proxy, that is, agricultural production and agricultural raw material export. In the contrary, agricultural production and agricultural raw material export granger-cause subsidy. Thus it can be said that the government subsidies on agricultural sector does not play significant role for agricultural development in the Republic of Macedonia. This clearly indicates that in the Republic of Macedonia, the government subsidies on agricultural sector are not using properly for agricultural development means that a number of irregularities in the proper management of agricultural subsidies still exist in the agricultural sector.

Table 2. Pairwise Granger Causality Test Results

Null Hypothesis	F- Statistics	Prob. Value	Decision
Agricultural Subsidies does not granger cause Agricultural Production	0.855	0.445	Accept H_o
Agricultural Production does not granger cause Agricultural Subsidies	3.757	0.044	Reject H_o
Agricultural Subsidies does not granger cause Agricultural Raw material export	2.041	0.160	Accept H_o
Agricultural Raw material export does not granger cause Agricultural Subsidies	2.878	0.083	Reject H_o

Source: Author's data analysis 2016

3.3 Regression Analysis of Short Run Effect of Agricultural Subsidies on Agricultural Production

The regression analysis was employed to examine the association between change of agricultural production and agricultural subsidies. In order to analyse this, the first difference of agricultural subsidies was regressed against the first difference of agricultural production to avoid spurious regression knowing fully well after the unit root test that the two variables are stationary at first difference level.

It was found in Table 3 that agricultural subsidies has a positive effect on agricultural production in the short run, but not statistically significant. The insignificant of this relationship clearly points that agricultural subsidies has not played a significant role on agricultural production, therefore, yet to transform to agricultural development in the Republic of Macedonia.

Table 3. Short Run Effect of Agricultural Subsidies on Agricultural Production

Variables	Coefficient	t-values	P-values
ΔAGRI_SUB	0.441	0.741	0.468
Constant	12.491	16.610	0.000

No of Obs = 24; F-Statistics = 124.1; Prob (F) = 0.001
Source: Author's data analysis 2016

4. Conclusion

Based on the findings we can conclude significant decreasing in the productivity of some products or continuous stagnation beside the progressive governmental subsidies. Even in some cases we have increased import of some products (raw or processed), and significant gap in the trade balance with negative pre-sign. On a long-term this will bring difficult situation for the Macedonian agriculture and the risk of more food-import dependency and hunger poverty.

Subsidies may give effects if the government take more responsibility and tidier control over the distribution. Parallel with the primary production must go on the processing agri-food sector which currently lacking in modern technology and capacity to meet local and regional demand. Therefore, the country is not yet prepared or facing lack of human capacity to follow the European Common Agricultural Policy (CAP) in terms of direct payments and financial distribution. After seven years continuous national support and four years of EU assistance in the agricultural sector, Macedonian agricultural productivity is into stagnation phase or slight declination. Such a situation will not harm only agricultural but also can make negative consequences on the whole national economy in general.

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The impact of Slovak entry into the EU on the selected indicators of wheat production in production areas

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Abstract
Agriculture is one of the most important sectors of the national economy of the Slovak Republic, in particular, for its long tradition and at the same time for a long-term great political influence of farmers. Therefore, each year flows into the agricultural sector in the EU countries huge amounts of money. Analysed period of 1999 - 2009 has been divided into two equally long period of time, in the middle of which the Slovak Republic entered the EU and the agrarian policy has changed from purely national to the EU common agricultural policy (Cap). Important reform of the CAP in 2003 was the Fischler reform, by which the single payments decoupled from production and began to provide per hectare of agricultural land. In this paper, we explore how our entry into the EU has been translated into the economy of the selected commodity (wheat) and how the support effected the rate of profitability and the economic income result during this period. For the assessment of the production of wheat, we used indicators such as the yield per hectare, the total and the unit costs, prices, total support. Two indicators have been chosen of the cost-profitability: profitability without support and profitability with the support and the hypothesis was set, by which we explore the development of these indicators per production areas that we divide on less-favoured and favoured. By the hypothesis we verify whether selected indicators confirm the natural expectation that in the better production areas will be achieved their more favourable values.
Thanks to the subsidies the economic income results in I. and also in the II. period got from the negative values only to a positive outcome.

Keywords: *wheat, production, profitability, support, favoured area*

JEL Classification: *Q02, Q14*

1. Introduction

The period within which we evaluate in this paper the development of agricultural policy, the development of Slovak agriculture and its structure of production can be considered in two directions as "breakthrough". The first period was characteristic by the completion of the transformation of the Slovak agriculture and the second was characterized by the entry of Slovakia into the European Union. The transformation of the Slovak agriculture is considered an economic necessity. On the basis of the available scientific and research work in the field of study of the development of agrarian policy and the CAP in Slovakia, we can talk about a significant impact on Agriculture of the SLOVAK REPUBLIC.

According to Tangermann, S. (2007) the CAP after 2013 must after decoupling of direct payments make them coupled to a specific goals and outputs useful for the society. The future development of the CAP will be significantly affected by the financial and then economic crisis. The economy of the Slovak agriculture has been greatly affected by the accession to the EU because annually it runs a large amount of funds in the form of subsidies to this sector.

Based on the concept of agricultural and food policy, agricultural policy in the cultivation of cereals is based on the principle of a high percentage of food sovereignty. The other principle in their cultivation is the intensification, which is a gradual increase in average of yields.

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Cost-effective production of cereals is a prerequisite for achieving high sales and earnings by adequately high own costs according to Borekova, (2004).

Production conditions of agricultural enterprises are different and dependent on natural conditions (climate, soil type, grain size, depth, stoniness, soil and its exposure). The social requirements for the farmers are to ensure the nutrition for the population which is not possible to satisfy only by the production of agricultural products in better natural conditions, but for production purposes are used even worse conditions, where the production cost are higher. **(**Chrastinova et al., 2001)

In terms of inputs, in particular in the production area of maize and beet there are used an intensive cultivation methods, which must ensure the profitability of their production. In the potato and potato-oat area, the cereals cultivation should not be at a loss and in the mountain area, emerging losses should be compensated by the subsidies. An intense production of cereals is also a basic condition for the export oriented subsidy policy by which to achieve competitiveness within the EU.

2. Data and Methods

The methodology of work is based on the use of theoretical and practical knowledge from the study of the literature. Work is focused on one commodity of crop production, namely: winter wheat. Observed time horizon is 11 years, since 1999 until 2009 and was divided into 2 periods due to the change in the pattern of the subsidies on the first period prior to entry into the EU in 2004 and the second beyond. We would like to show the effect of these changes on two equal periods of time. The dates for period before entering the EU were found just from 1999, therefore the years chosen to compare were chosen till 2009 and not longer. We try to point out the changes in the structure of the areas and production of selected commodity and to determine whether this commodity is losing or increasing its importance.

Calculation of costs, support and profitability of commodity is based on the methodology of Research Institute of Agriculture and Food Economics. Summary reports are developed for research purposes in a different classification and cost structure. The results presented in the publication are used primarily to evaluate the efficiency of production of agricultural products in different environmental conditions, in forecasting agricultural policy, various analyses and comparisons of costs. The publication data are processed on the actual costs of selected plant and other economic data to assess the efficiency of production.

This survey is done on selected set of farms divided by five types of production areas, namely:

<u>C - Corn area</u> - is an area with the most favourable conditions for the development of agriculture. The most important regions of this area are the Danube and East Slovak lowland. <u>B - Beet area</u> –area in flat and hilly parts of the lowlands and occupies the territories of the Záhorská lowland, Košice, and south Slovakian lowland where the conditions for growing are great for mostly sugar beets and intensive cereals.

<u>P- potato area</u> – area in Orava, Kysuce, Podtatranska kotlina and in the low Beskydy Mountains.

<u>PO- potato and oat area</u>, where mostly potatoes, forage crops and less intensive cereals as oat are grown.

<u>M- mountain area</u>, composed mostly from sub mountain and mountain regions where less intensive cereals, forage crops and potatoes are grown.

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For the purposes of this work on the basis of research of Chrastinová (2010), Foltín (2008) the production areas were put together and associated with the less favored areas (LFA):

C+B: favored areas outside of the LFA (non-LFA).

PO+H: areas of the LFA.

P: areas outside of the LFA and partly with the LFA areas.

Total support (TS) contain all the support allocated on wheat by (RIAFE).

P- profitability, S- support, P+ S profitability with support, P-S profitability without support

Pz-prize, Y-yield per hectare, UC - unit cost per tons, US- unit support

(TS/Y), TC-total cost per hectare,

The calculation of profitability:

P-S = Pz / UC

P+S = (Pz +US) / UC

Hypothesis1: The selected indicators in the assumption confirm the natural expectation that in the better production areas will be achieved their more favorable values.

The assumption:

Y (C+B) > Y (PO+H)

TC (C+B) > TC (PO+H)

Pz (C+B) > Pz (PO+H) - This assumption is based on the expectation that the soil-climatic conditions in the better production areas positively affects the amount of prices as a result of higher production quality.

UC (C+B) < UC (PO+H)

P-S (C+B) > P-S (PO+H), P+S (C+B) > P+S (PO+H)

(Foltín 2008)

The basis for the collection of data in the studied area for the theoretical background was continuous monitoring and study of available professional domestic and foreign literature, scientific journals and book information, obtained through libraries, the Internet and other sources.

3. Results and Discussion

The entry of Slovakia into the EU influenced also foreign trade of cereals. It was a system of direct payments for the production of selected agricultural products and the SLOVAK REPUBLIC started to adapt to new rules and conditions.
Area under crops of cereals in Slovakia in 2005-06 was 799.8 thousand of hectares and harvest area reached 794.7 thousands of hectares. Compared to the previous marketing year, the areas under crop were less about 2.22 % and harvest area was smaller about 2.55 %. The average yield of cereals at that time of 4.51 hectares per tonnes was compared to the 2004-05 marketing year lesser about 0.14 tonnes. Yield of all cereals in 2005-06 was 3 585.2 ths. of tons and compared to the previous year it was about 207.9 thousands of tons lesser.

Growing wheat achieved its peak in SR in the year 2001-02, when the area under crops amounted to 446.5 ths. Ha, harvested area was 448.9 ths. Ha, the yield was 4.01 tons per

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hectare and the production has reached 1800.1 thousands of tons. Even the domestic consumption amounted to its historical peak in volume of 1682.3 ths.of tons. especially on food and animal purpose. In the long term view, from this period, the area under crop and the harvested area of wheat in the Slovak Republic decrease. Except the years 2008-09, when the production of wheat reached maximum value in the amount of 1819.5 ths.t. the production of wheat has decreasing tendency.

In 2004-05, the production of wheat reached the second-highest level since 2001-02 in the volume of 1764.8 ths. t, representing an increase by 89.68% compare to the previous year, when production was at an extremely low level of wheat (930.4 tis. t). Still, even at a low initial stock, which has caused a sharp increase in imports, increased consumption compare to the previous year, it also came to a sharp increase in exports, up to 201.78% higher than in 2001-02. In comparison with the record crop in 2004-05, the production of wheat in 2005-06 was reduced by 8.9%. Domestic consumption compared to the previous period only slightly decreased, however, due to the high initial stocks of wheat the export volume could reach 451.8.ths.t. and this has contributed to the reduction of stocks to 232.8 ths of tons. In the period 2006-07 the area under crop and the harvested area of wheat decreased again and also yield of wheat decreased, which contributed to the reduction of the total wheat production for about 16.5 %. Lower initial stocks increased the volume of imports by 194.40% over the previous period. The domestic consumption and exports has reduced. The total consumption has been also reduced from the previous period by 13.23 % and the export decreased about 12.78 % which lowered the final stocks on 173.8 ths. of tons. Stocks fell compared to the previous period by 25.34 %. In comparison with 2006-07 wheat production in 2007/08 has risen slightly. This has a connection in slight increase in cropping and harvesting areas, however, the yield of wheat slightly decreased by 0.78%. Lower initial stocks and import slightly decreased the total supply. With a lower total consumption final stocks slightly increased compared with the previous period by 17.08%.

Table 1: Balance sheet of wheat in Slovakia

Indicator	units	2001/02	2004/05	2008/09	2009/10
Area under crops	ths.ha	446,5	369,4	374,4	380,3s
Harvesting area	ths.ha	448,9	367,8	373,7	379,2s
Yield	t/ha	4,01	4,80	4,87	4,06s
Production	ths.t	1800,1	1764,8	1819,5	1537,9s
Initial stock	ths.t	177,2	79,0	209,6	*713,7
Import	ths.t	2,2	55,3	158,5	120,0
Other source	ths.t	0,0	82,0	50,3	48,3
Total supply	ths.t	1979,5	1981,1	2237,9	2419,9
Domestic consumption:	ths.t	1682,3	1357,8	1104,5	878,1
-food	ths.t	521,2	530,2	443,7	470,0
- seed	ths.t	104,9	110,6	109,5	105,0
-fodder	ths.t	860,5	560,0	330,6	196,0
-other	ths.t	195,7	157,0	220,6	107,1
Export	ths.t	50,5	152,4	385,9	577,0
Other costs	ths.t	25,0	122,6	33,7	26,5
Total use	ths.t	1757,8	1632,8	1524,1	1481,6
Final stock together	ths.t	221,7	348,3	713,7	938,3

Source: Statistical office of the SR, RIAFE: cereals: situation and outlook reports 2004- 2009

Crop and harvest wheat area in 2008-09 were larger than the previous year. The yield per hectare was higher by 27.49%, (1.05 tons) and the production of wheat reached a historical

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maximum in observed period and was about 31.89% higher than the previous year. Production, together with an initial stock and increased import with at the same time slightly elevated domestic consumption and export has created an increase of final stocks in the volume of 713.7 ths. t., which represents interannual increase by 240.51%.

In the period of 2009-2010, crop and harvest areas of wheat slightly increased, however, the decrease in the yield by 16.63% compared to the previous year decreased the total production by 15.48% to 1 537.9 thousands of tons. Initial stock together with the reduced import contributed to the increase of the total supply and at a reduced domestic consumption (especially for the feed purposes – by 40.71%) the export increased. Final stocks has increased by 31.47 % to the value of 938.3 ths. tons.

3.1. Trend of the selected indicators of winter wheat for the period of 1999-2009 according to selected production areas and per Slovakia in total.

Table 2: Average values for the period I.1999-2003 and period II. 2004-2009

	Period 1				Period 2				Index
Indicator	**C+B**	**P**	**PO+H**	**SR**	**C+B**	**P**	**PO+H**	**SR**	**SR 2/1**
Yield t/ha	4,068	3,376	3,329	3,892	5,0108	4,1717	3,7283	4,755	122,17
Area ha	18800	7962,8	2462,6	50487	15623	4548	1979,3	39752	78,736
Production t	76542	26947	8394,4	196763	77798	19062	7367,7	189397	96,256
Total cost.€/ha	566,15	513,56	572,57	554,19	703,76	606,47	627,65	679,93	122,69
Unit cost. €/t	136,42	149,29	166,6	139,04	137,99	142,69	162,22	139,68	100,47
Prize €/t	133,23	123,45	126,93	131,66	136,35	126,57	121,1	134,88	102,45
Total support €/t	14,97	35,949	35,278	18,965	24,632	46,445	64,22	29,892	157,62
Profitability without support %	**-1,049**	**-15,73**	**-21,96**	**-4,083**	**-0,509**	**-10,91**	**-23,7**	**-2,737**	**-**
Profitability with support %	**9,924**	**7,7193**	**-1,29**	**9,4366**	**17,526**	**21,275**	**15,925**	**18,754**	**198,73**
Income €/ha	34,206	852,4	-27,97	30,937	117,35	115,49	54,084	111,81	361,4
Income €/ t	7,8469	8,3411	-9,709	3,1301	23,288	28,788	13,272	22,242	710,6
Income €/t without support	-7,124	-27,61	-44,99	-15,83	-1,344	-17,66	-50,95	-7,65	-

Source: author's calculations according to RIAFE

P- profitability, S- support, P+ S profitability with support, P-S profitability without support
Pz-prize, Y-yield per hectare, UC - unit cost per tons, US- unit support

The results for the hypothesis stated in methodology:
For the average values from period I. and period II. we can conclude that:
Y (C+B) > Y (PO+H)
Yield per hectare: for both periods we can say, that the yield in area: C+B > PO+H
(this assumption is confirmed)

TC (C+B) > TC (PO+H)

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Total cost: in the I. period the cost in PO+H > C+B by 6.42 €/ha (assumption is only confirmed in II period)
UC (C+B) < UC (PO+H)
Unit cost per ton: for both periods we can say, that costs per tons in area C+B > PO+H (this assumption is confirmed)

Pz (C+B) > Pz (PO+H)
Prize: for both periods we can say, that the prize in C+B > PO+H (this assumption is confirmed)

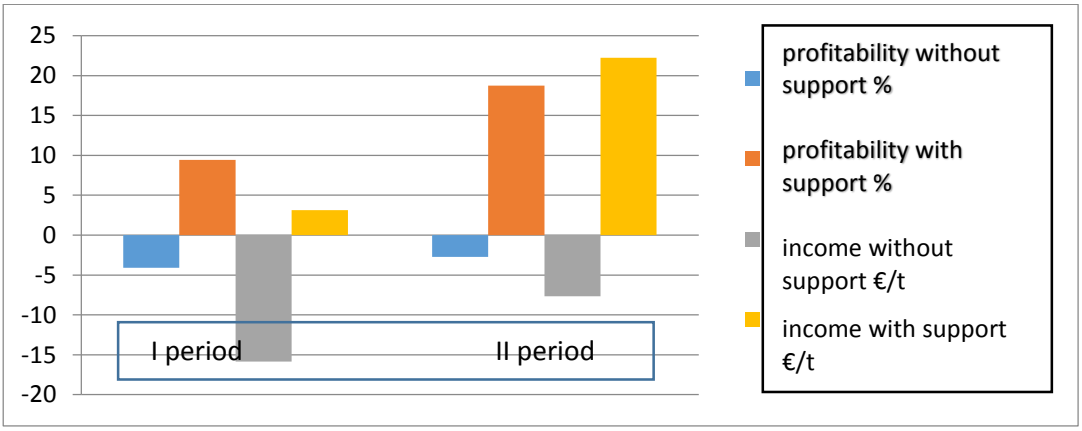
P-S (C+B) > P-S (PO+H), P+S (C+B) > P+S (PO+H)
P-S; P+S: for both periods we can say that P-S and also P+S are higher in more favourable area of C+B (this assumption is confirmed)

A hypothesis about the production areas in the period I (before accession to the EU) was not confirmed only for the total cost per hectare. Throughout this period, in the area of PO+H were the highest total costs per hectare in 2003 and compared to the area of C+B were higher by nearly 59 €/hectare. In this year unit cost were also at the highest value simultaneously at the lowest production, not only for (I) but also for the II period. This has reflected also in the P-S and P+S in the areas of PO+H, which as the only area of production has reached negative values for the whole I. period without support and even with the support.
During the period I for the average of SR the yield per hectare was 3.89 t/ha as a result of unfavourable year of 2003. In the period II. yield rose by 0.87 t/ha due to the impact of favourable years in 2004 and 2008, which is a growth of 22.17%. In the period I and II supports have been paid to the producers, which they have reached the average value of 19 €/t in I. period and 29.9 €/t in II.

Profitability without support through the transition from I period to II. has not changed much and has remained slightly negative. The impact of the support has significantly reflected in profitability in the period I and II, which increased on average by up to 57%. In the period I negative profitability have changed thanks to the support to positive on 9.44%. In II. period profitability with the support increased on the level of 18.8%.

There has been a significant change in profitability with support as a result of the impact of increasing support after joining the EU, compared to the period prior to entry.

Figure 1: Profitability and income of wheat with and without support for the I. and II. period.



Source: author's calculations according to RIAFE

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Compared to I. period P+S in average of the SR, increased in the II. by almost 10% Significant increase was seen in the production areas, with the largest increase occurred in the production area of PO+H where P+S has increased by more than 17%. In the II period profitability in PO+H with the influence of support to less-favoured areas increased from minus 23.7% by nearly 40% and reached a value of about 16%. Profitability in this area almost adjusted to the C+B area of 17.5.
Thanks to the subsidies, the income in I and also II period got out of the negative values to the positive outcome, besides the area of PO+H in the I period where it still remained negative.

A significant impact on the change of the profitability P+S in period II had also a highly favourable year of 2004, when has been reached the second highest yield per hectare of 5.3 t/ha at the lowest unit cost of 113.46 €/t for the whole reference period in SR. The highest P-S was in 2004 with the value of 19.72% and in 2007 when it was at historic maximum of 21.45%. The profitability with support in the II period reached its highest value of 43.88% in 2007 to what had an impact the historically highest prize of 189.27 €/t and also the highest support of 34.96 €/t, while normal yield of 4.24 t/ha and the production of 158,236 t.

Production for the average of SR in the period II reduced compared to the period I by almost 4% and was decreasing in both periods also in production areas, besides the area C+B in which the production was at about the same level compared to the period I. The reduction of production is influenced also by harvested areas, which have their share also decreasing for all production areas, and compared to period I have been reduced for about 21.53%

The opposite trends were seen in the total costs, which increased in all areas and in the II. period increased on average by about 22,69% compared to the I. The unit costs and prizes remained at about the same level. There was an increase of unit costs only by 0.46 % and prizes slightly rose by 2.44%.

4. Conclusion

The CAP, which is superior to the national policies determines the common rules, principles, objectives and conditions for the provision of subsidies to farmers in all Member States. In the agrarian policy there is a number of tools and mechanisms by which it is implemented and one of the most important are subsidies which, according to many studies, has an impact on the overall development and thus the structure of the production of commodities.

Data processed in this paper were drawn from various sources, one of the most essential of which is RIAFE and their results of the survey of agricultural products within the selected file of business entities. According to the (RIAFE, 2000): "these are the only data that allows to evaluate the economics of agricultural products in the Slovak Republic."

After the entry of Slovakia into the EU agriculture in SR recorded a slight recovery, which can be attributed to in particular the growth of support, however, this did not continue in constantly increasing trend. In the years 2004 – 2008 was the development of agriculture, cyclical with fall and the rise of the individual indicators.

The entry of Slovakia into the EU has introduced a system of direct payments for the production of selected agricultural products and the agricultural sector of SLOVAK REPUBLIC started to adapt to the new rules and conditions.

Due to the fact that the production of wheat takes approximately 35% of the total cereal production, it can be considered as the most important crop within the cereals on the world. The development of wheat over the selected period is very similar to the development of cereals.

From 2001-2002 the area under crops of cereals in the Slovak Republic has decreasing tendency and the yield per hectare slightly increases. The production is uneven, reflecting both the area under crops and yield. The consumption of cereals decline and mostly those for feed purposes. We see similar trends in the cultivation and production of wheat, in the overall declining consumption where it is dominated by, in particular, reduction of the consumption of wheat for feed purposes which decreased approximately 3.5 times in 2010 compared to 2001.

We have analysed the wheat in production areas, divided into advantaged and disadvantaged areas and we explored whether the natural expectation that applies in a more favourable production areas have achieved better value of selected indicators (yield per hectare, the total and unit cost, the prize, profitability without and with support and the income). The reference period 1999-2009 has been divided on I. period before and II period. after the entry of the SR to the EU, and we explored the changes after 2004, when the single farm payments decoupled from production.

From the index analysis of winter wheat in average of SR results that the production decreased by almost 4 % compared to period I, what was influenced by the harvested areas, which fell as much as by 21.5 %. The costs per ton and the prizes only slightly increased on the contrary to the subsidies that greatly increased by up to 57%. Calculated profitability, which was throughout the reporting period without the support negative has change to a positive values as well as the income, due to the impact of the support. According to the results the corn-beet production area, which was considered to be advantaged, was in both periods more profitable. Disadvantaged area of potato-oat-mountain, however, thanks to almost three times higher subsidies almost adjusted to the advantaged area in the second period and the difference in profitability was only 1.6%.

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Cooperation of small farms in agriculture complex of the Republic of Kazakhstan

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Abstract
The article presents the organizational and economic substantiation of the necessity and importance of the development of agricultural cooperatives in the agro-industrial complex of the Republic of Kazakhstan. The main factors hindering its development and spread are revealed. The features of the establishment and functioning of the existing forms of agricultural cooperatives (cooperatives, rural consumer cooperatives, rural consumer cooperatives of water users, agricultural partnerships), positive and negative tendencies of development are defined. On the basis of the analysis and the state of development of agricultural cooperation of the Republic the necessity of improving the legal framework, the current mechanism of the state support, the formation of stimulating factors combining small farms in agricultural cooperatives and other measures for their effective functioning is proposed. The urgency and priority of co-operation process of small farms with the aim of stabilizing the agribusiness economy is disclosed. The main provisions of the new Law of RK "On agricultural cooperatives," goals and objectives of the recommended co-operation models, the benefits of association of small farmers in agricultural cooperatives, as well as the expected re-results from the implementation of the measures for the development of this process, contributing to solving the problems of small-scale nature of agricultural production, the availability of small forms of managing state support measures and others are offered.

Keywords: *agricultural cooperatives, small forms of management*

JEL Classification: *L220, M130, Q130*

1.Introduction

Agricultural cooperation brings together agricultural producers for the joint production or other activities to ensure the economic needs of their households (processing, product marketing, supply the means of production, etc.).

The scientific basis of the cooperative movement and cooperative business created and developed several generations of scientists and cooperative practitioners of different countries. The names of many of them, especially the founders and popularizers of the theory of cooperative (R.Ouen, Sh.Fure, F.Rayffayzen, Karl Marx, Friedrich Engels, M.I.Tugan-Baranovsky, A.V. Chayanov et al.) are well known. Some of them (R.Ouen, Sh.Fure) were members of the cooperative utopian theory and believed that through the establishment of a wide network of necessarily non-profit cooperatives (co-operation was seen as the antithesis of the market) can be converted to the ideal society of social justice principles. The others (in particular F.Rayffayzen, A.V. Chayanov) were representatives of the practical direction in the theory of cooperation emanating from the needs of life itself and of the interests of small producers.

Cooperative is a living, constantly evolving socio-economic mechanism. Its content, function, mechanism of activity as we move from the initial simple forms to more perfect, adequate qualitatively a new state and level of development of material production are constantly changing. For example, if at the beginning of the cooperative movement cooperatives joined together into one in order to survive, in a market economy the cooperative takes the form of business activity and starts to have more and more entrepreneurial feature. A kind of general "benefit" or the goal of "meeting the needs" is transformed into a real economic benefit, into

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the real tangible goal in a market economy - to obtain the greatest profit. Otherwise, the cooperative "does not fit" in the sphere of market competition, and hence, in market relations altogether. At the present stage of transition to a market economy, as well as from the standpoint of international experience in the framework of the International Cooperative Alliance, these and other aspects of the theory of cooperation requires critical rethinking, not to mention the Marxist views on the theory that are not objectively and critically analyzed, and most importantly in some fundamental aspects of understanding the essence of cooperation have not been overcome in practice.

2. Data and Methods

The analysis of methodological approaches of the effective functioning of agricultural cooperatives, a generalization of works of scientists in Agriculture Economics allowed us to articulate the essence of the functioning of co-operative units, which is that they provide the conditions for bringing people together, who set a goal to improve their economic situation and mainly to contribute to the development of free entrepreneurial activities and business, advocacy of agricultural producers in the various levels of government. The study of organizational and economic mechanism of functioning of agricultural cooperatives shows that the efficiency of agricultural cooperative units is the final beneficial effect of the use of production resources, that cooperate on the basis of social - economic relations to meet the needs of their members.

Agricultural cooperation creates the effect of the addition of the amount of the efforts of all its members, and some indirect effect, which may often be measured only indirectly. Therefore, to determine a synergistic effect can be associated with the work of agricultural producers before and after the entry into agricultural cooperatives, and the economic efficiency of the cooperating formations tends to be slightly higher than the total effect obtained previously own.

We studied the methods for assessing the industrial, commercial, financial activities of cooperatives in the process of research approaches to evaluate the effectiveness of agricultural cooperatives. The efficiency is determined by the degree of utilization of intensity depending on the concentration and the specialization of production. The ratio between the volumes of production and wasted resources is analyzed. The efficiency of commercial activity is considered with position of market parameters (sales, supply and demand). The indicators of business efficiency (agribusiness), include profits, added value, the unit cost per unit sales cost, profitability of sales. The effectiveness of financial activity characterizes the state of the financial resources and their ability to ensure the continuity of production and sales of product (works, services) on liabilities to other economic entities and the state.

The effectiveness of the corporate form must be evaluated from the perspective of the temporal and spatial aspects. Spatial boundaries include the analysis of the effectiveness of co-operative structures by region and within the region for each object of observation. The economic evaluation of the functioning of co-operative groups in terms of time is given depending on organization legal and economic circumstances prevailing at the time of their creation, or which are essential in the period of activity. In both cases, the impact and the role of co-operative structures to improve the efficiency of production of agricultural production are determined.

3. Results and Discussion

Today, cooperation and collaboration of market is especially true. In the context of the formation of the agricultural market in the country co-operation process has the character of the individual attempts of cooperation ties between the producers and consumers. Therefore, to adapt agricultural production to market conditions become particularly important conceptual basis for

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the organization of production enterprises of various forms of economic activity on the basis of their cooperation.

It should be noted that the agriculture of the republic suffered from the major damage as a consequence of the gap of production linkages between agriculture and processing industries, the sale of products and agricultural services. Economic relations with agricultural producers and processors serving pre-acceptance is a complex problem. It worsened during the period of reform and privatization in the agricultural production, where each household or enterprise operating in market conditions, sought to obtain the maximum profit on their own, independently of social interests.

In the course of the organizational and economic changes of recent years, the interests of the main participants - agricultural producers - to a greater extent have been infringed because of fundamental errors in the field of agricultural policy, monopolistic actions processing, servicing and resource providing enterprises in relation to the agricultural sector. These actions are manifested primarily in the diktat of prices for purchased products and services offered machines, resources and services. Price of sold goods does not always provide compensation for producers in its production costs. Reimbursement (if it occurs) is not more than 6% -10 profit.

Under these conditions, agricultural enterprises were forced to direct their own to sell their products to customers, and to start building their own processing facilities. The lack of sound economic policies in this matter led to the diversion of major resources of agricultural producers to inefficient production.

Thus, firstly, the processing enterprises lost their raw material zones, unable to fully load its production capacity. Secondly, the construction of small processing powers inside agricultural enterprises postponed the replacement of raw materials for the production of technology due to lack of funds for these purposes.

Rapid transition to a market economy with insufficient infrastructure development contributed to strengthening market monopoly refining and trading companies, the emergence of numerous intermediaries, reduction of production volumes in almost all types of agricultural products. In addition, there have been some changes in its structure by types of farms: in agricultural enterprises and farms in the main development of crop and livestock production is concentrated in households. So, according to data of the Statistics Agency, the share of households in total gross agricultural output was 52.7%, including crop production - 26.9%, and livestock - 78.1%.

This trend is confirmed by the high share of this category of farms (peasant farms) of the total number of farm groups, especially in southern regions. Figure 1 shows that 36.8% of the proportion of farms of South Kazakhstan region, 29% - Almaty region to the total number of farms of the Republic of Kazakhstan. In addition, there is a tendency reducing allotments of agricultural producers: 65% of farms have a land to 50 hectares, the average size of land agricultural enterprises have decreased, for example, in the southern region of 6 times (Figure 2). All this confirms the nature of small-scale commodity farming, which justifies the need to unite the efforts of small farms.

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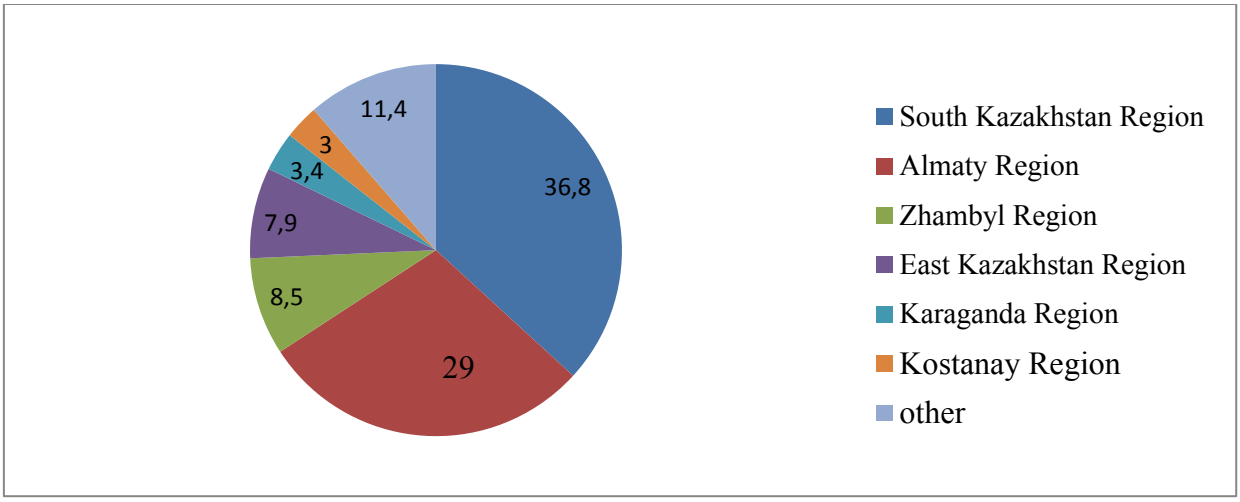
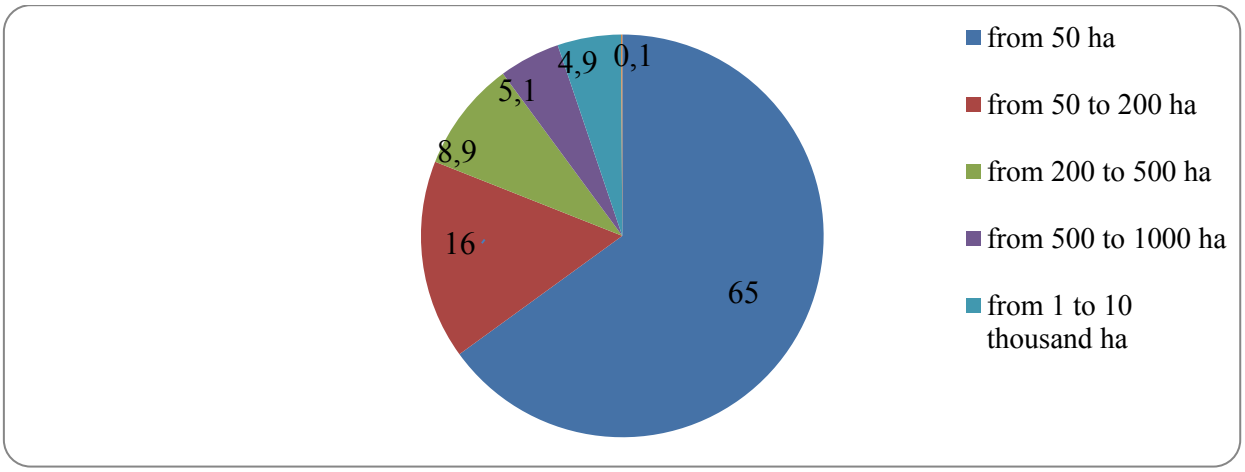
Figure 1 - The share of farms by region in their total population in the Republic of Kazakhstan,%



Source: Agency for Statistics

Figure 2 - The share of land holdings of farms in the total area of agricultural lands of the Republic of Kazakhstan,%



Source: Agency for Statistics

The measures of state support in the form of subsidies, concessional lending, are not available for the most of small farms, , due to the mismatch of their requirements, lack of collateral and others. The low level of small and medium business entities income does not allow start-up capital for business development in rural areas.

Thus, the basic prerequisites for the development of cooperation of small farms in the agricultural sector of the Republic of Kazakhstan are:

- The need to restore the destroyed relations between agricultural producers and enterprises procurement, storage, processing and marketing of finished products;

- An urgent need to create a new investment system of rural producers;

- Lack of financial resources and investment in the country;

- The loss of a significant share of domestic product market due to the presence on it of imported products;

- Problems associated with the sale of agricultural products, material and maintenance of agricultural producers;

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- Creation of a stable resource base, improving the quality and competitiveness of food products and others.

As international experience shows, the cooperative form of agricultural relations with enterprises processing and marketing of products provides a higher efficiency than the disparate enterprises. At the same time the most used existing material and technical base of agricultural and processing sphere. Agricultural producers have a guaranteed market for their products, and processing capacity of enterprises involved as much as possible.

Currently, one of the most important problems of development of the agrarian sector is an undeveloped system of procurement and distribution of agricultural products. The current state of development of the agro-industrial complex is characterized by spontaneity and unsystematic. This is due to the fact that the market structures movement of agricultural products have not been created to ensure that producers required guaranteed sales instead of the destroyed purchase and sales system. All this has led to the strengthening of the role of intermediaries in the realizable net, practically superseded the procurement system, thus completely eliminated the relationship of producers and processors of raw materials. Low purchasing prices for agricultural products, dictated by processing enterprises, do not stimulate an increase in the volume of their production, which, in turn, leads to an unloaded power and capacity of elevators, meat and milk factory, decreasing of the efficiency of their operation.

Due to the requirements of high-quality, affordable and well-packaged products small and medium-sized enterprises are unable to compete with regular suppliers. Traditional coordinating actions of enterprises of various spheres of AIC and contradictions of their interests disturb. The organization's own re-processing of meat, milk and other products, the majority of households can not afford due to the lack of resources and experienced personnel necessary for the sanitary requirements and stringent fiscal conditions, high unit costs, large losses in barter transactions by intermediaries. There is a lack of its own sales network, the creation and the contents of which are not available to every enterprise.

Today 1473 production, 1545 rural consumer cooperatives and 346 rural consumer cooperatives of water users are registered in the Republic of Kazakhstan. However, violations of cooperative principles are observed today in functioning cooperatives, in particular the full economic independence, the right to obtain ownership of the respective share of collective property, including land, voluntary membership in the cooperative, exit right to your property a share of the cooperative. A member of the cooperative must benefit economically from this association to enhance their economic activity, in fact, there is a situation where a member of production cooperative feels in its household employee more than the owner.

In our opinion, cooperatives should be a transitional form on the way of formation of service cooperatives as the prevailing and dominant position in the agrarian structure. At the present stage of reforms one of the important tasks is to present on the basis of agri-industrial cooperatives recreate the group members - the owners of the-and-earth property shares. This recreation should be strictly voluntarily and differentially based on the economic and social benefits of this form of cooperation.

The created rural consumer cooperatives (RCC) for the last three years have not yet been properly developed, despite the measures taken by the Ministry of Agriculture of the Republic of Kazakhstan, JSC "Agrarian Credit Corporation", which provides a concessional lending of RCC for a period of 5-7 years at the interest rate to 5% per annum. The number of created RCC today is small in a republic, due to distrust of the rural population to created new structures, lack of coordination of interests of participants of cooperation, lack of collateral or illiquidity in lending, as well as the lack of allocation of JSC "Agrarian Credit Corporation" financial means to create the RCC.

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Research of existing forms of agricultural co-operatives revealed the main problems hampering their development:

- Unavailability of agricultural enterprises, and the rural population in cooperation, lack of understanding on the part of members of the benefits of co-operation, their rights and duties, as well as the mechanism;

- The establishment of cooperatives in the interests of large-scale farming, which is the initiator, and in fact provides a guarantee of the owner of the cooperative;

- Untimely execution associations commitments to implement the project;

- Lack of own production facilities, suitable for the installation of the equipment;

- Insufficient or no liquid collateral;

- Lack of raw materials for downloading the purchased equipment and facilities;

- Low professional training of managerial staff and the lack of technology experts;

- The inability to act in the market with larger batches production due to fragmentation of cooperatives;

- Limited access to the cooperative implementation of products to the retail market;

- The absence of tax benefits for cooperatives;

- Lack of coordination of interests of participants of cooperation;

- Processing and service businesses are reluctant to loss of a monopoly position in relation to the agricultural producers in the event of merger. The AIC processes are more successful, where the integrator are processing plants;

- Lack of legal support. Using the organizational and legal forms of the non-profit association does not allow for the type of business activity. Insignificant allocation of public funds for development cooperation.

The priority of small business development confirms the acceptance in recent years, policy documents (Agribusiness-2020, -2050 Strategy, Business Road Map 2020, Nurly Jol et al.). In his message the President of Kazakhstan Nursultan Nazarbayev from17 January 2014 noted the need for "the removal of all barriers to business development in the agricultural sector, the process of cooperative farming, efficient land use." Action Plan to implement the orders of the President of Kazakhstan on the basis of an expanded meeting of the Government of the Republic of Kazakhstan from February 14, 2014 provides for the development of the Draft Law "On Agricultural Cooperation", aimed at facilitating the creation and development of agricultural cooperatives.

The main "barriers to the process of farming cooperatives" include:

- A high level of distrust of agricultural producers, especially small farms, to the newly created entities, the fear of losing the only means of production - land;

- Low level of legal culture in rural areas, the lack of farmers' awareness of the benefits of agricultural cooperatives (a special form of organization of production, aimed at joint management, control, financing and use of the results of labor);

- Imperfection legal and regulatory framework governing the activities of cooperatives (the presence of many laws, characterized by repetitions and contradictions), the lack of specialized coordinating and controlling bodies (associations, etc.), Regulating the legal, organizational and economic conditions for the creation of agricultural cooperatives, which led to the wrong

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registration of them, accounting, income distribution and other violations of cooperative principles;

- The lack of stimulating factors association of farmers in the rural cooperatives, in particular the inability to distribution the net income of the cooperative (created in the form of non-profit organizations) among its members;

- Imperfection of the current state support for agricultural cooperatives mechanism (insufficient volume of funds allocated for the provision of concessional lending through JSC "Agrarian Credit Corporation", while concessional lending and taxation are only one form of cooperatives - agricultural consumer cooperatives and other forms of (rural consumer cooperative water users, production cooperative, agricultural associations, and others.) are not available.

The above problems justify the need to find new approaches for the development of small farms and their associations in the agricultural cooperatives. One of the new approaches to solving existing problems include the drafting of a common law "On Agricultural Cooperation", developed by the Ministry of Agriculture of the Republic of Kazakhstan jointly with the Kazakh Research Institute of Economics of agriculture and rural development. The bill was adopted in October 29, 2015 by Parliament of Kazakhstan and implemented by January 1, 2016

The main provisions of the new represented Bill include:

- Taking into account the economic nature of the agricultural cooperative is necessary to take it to the status of the commercial organization in the legal form of the production cooperative, according to the Civil Code of the Republic of Kazakhstan;

- An agricultural cooperative created on the basis of membership by a voluntary association of individuals and (or) legal entities for joint production and (or) other activities in order to meet economic and social needs of its members in the production, marketing, storage and processing of agricultural products, the supply of the means of production and logistical resources and other service;

- Allocation of net income between the members of the cooperative is made in proportion to their participation in the production and (or) other economic activity of the cooperative;

- Activation of the mechanism of state support for agricultural cooperatives measures to stimulate the process of association of small farms by prioritizing allocation of state support (subsidies, concessional lending, taxation, etc.) to agricultural cooperatives;

- Specified the main objectives, principles of creation and operation of agricultural cooperatives.

4. Conclusion

It is expected that the implementation of the main objectives of the adoption of the new Law "On agricultural cooperatives," will:

- increase the value of agricultural cooperatives for rural population and agricultural producers to implement the features and benefits of co-operative principles in the process of merging small farms, the efficient use of land resources, the organization of stable sales of products, storage, processing and other services;.

- ensure increase agricultural income (the main founders of the cooperative) through efficient operations, eliminating intermediaries and the impact on the price ratio on the market;

- systematize and strengthen the measures of state support, and adjust the availability of all forms of agricultural cooperation;

- prevent the violation of the principles by the agricultural cooperatives controls democracy, appropriation of cooperative property by individuals through their illegal transformation into various JSC, LLP, intentional bankruptcy of agricultural production cooperatives, corruption schemes of intermediaries for assigned revenues of agricultural producers;

- improve the regulatory and legislative framework by combining all forms of agricultural cooperation as an independent group of individuals "agricultural cooperatives", characterized by the special status of cooperation as socially significant phenomenon.

The advantages of combining small farms into agricultural cooperatives are:

- Members of the cooperative with membership in agricultural cooperatives, against retain their legal and economic independence, i.e., remain owners of the land, manufactured products, agricultural machinery available;

- Stable sales warranty of produced agricultural products without intermediaries;

- Reduction of agricultural producers the cost of transportation, delivery of raw materials to processing or on the market;

- Protection of the interests of members of the cooperative, the availability of the right to vote at the general meeting ("one member - one vote" regardless of the percentage of participation);

- Ensuring the stability of the basic means of production (fuel, seeds, fertilizers, agricultural machinery, technological equipment and other.);

- Ensuring stable employment (permanent and extra work in the season).

The above advantages obtained by combining small farms in agricultural cooperatives will contribute to the stabilization of the domestic agricultural production, reduce dependence on food imports. The government reduces administrative costs, increased efficiency and goal orientation of measures that eliminate the need for state support of small farms development of agricultural cooperatives affects the efficiency of public policy by providing cooperatives by financial and technical support. Thus, the state providing support directly to agricultural cooperatives enhances the effectiveness of the implementation of state programs for the development of agro-industrial complex. In turn, the rural cooperative meets socio-economic needs of its members, in particular small farms. Thus, agricultural cooperatives are effective institution strengthening productive activity and improve access of small farms to markets, improve their pre-courses, gaining access to new technologies, and others.

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SESSION 2

Bioeconomy, resource management and sustainable development

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Evaluation of the impact of labour costs development on grapevine production in the Slovak Republic through algorithms

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Abstract
In the paper, on the basis of the analysis of statistical data of the Research Institute of Agricultural and Food Economics, we evaluate management (production) and economic indicators of labour productivity of selected agricultural commodities in crop production, i.e. grapevine.Selected managerial and economic indicators were evaluated within the selected group of economic operators of the Research Institute of Agricultural and Food in the years 1999 - 2013 (15 years).
Then we quantified the impact of changes in management and economic parameters of production in connection with the use of labour force under the labour costs development, depending on labour productivity of grapevine through algorithms.
The main aim of this paper is to analyze the impact of labour costs on the production of grapevine and their ultimate impact on the labour force in manufacturing and economic conditions of the SR, which results in the increase or loss of job positions. The time horizon of the investigation falls within the period 1999 – 2013 and the underlying data were drawn from the Research Institute of Agricultural and Food Economics and the database of the Statistical Office.

Key words: *labor costs, labor productivity, crop production, grapevine*

JEL Classification: *Q19*

1 Introduction

The status of crop production in various regions of Slovakia affects the character of change. Crop production in the economic conditions of the Slovak Republic is strongly influenced by price volatility, yield per hectare crop, intensification factors (fertilization, treatment, irrigation) and climatic conditions in a given year that are limiting for successful business in crop production.

The basic prerequisite for the development of the current state of labor costs is the availability of objective information and their effective use in defining the assumptions and future strategies. In the global context, it is particularly important to assess the development of average wages and consequently differences not only within individual economies, but also particularly between economies with each other. The widening gap in economic development, but also in wage levels are due to differences in productivity, in education, in technical and capital work and work organization and production (GANS – KING, 2009).

Agriculture among all sectors of the national economy has one of the lowest labor costs per employee. The total nominal increase in average wages in agriculture has been long accelerated only through faster growth in average wages senior technical and administrative staff. Employment in agriculture so far only a few uses and technological innovation and prevails simple manual labor with low representation of new technologies (BUCHTA, S. 2010).

The state will often try to intervene to prevent the decreasing trend in wages in the agricultural sector, which is mainly caused by differences in the intensity of productivity growth. In developing countries, real wages in agriculture grew in the 70s and 80s and this was one of the

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main reasons for reducing rural poverty. A large proportion of this growth was also the development of non-agricultural employment, the conventional government-sponsored employment. But now, with the increase in agricultural prices, falling wages in poorly organized sector and a decline in government-sponsored non-agricultural employment in rural areas, the agricultural population becomes adversely affected (JANKACKÁ, K. 2009).

Labour productivity in agriculture has two important aspects. It represents a profound impact on national prosperity, i.e. national income per capita. And also determines the standard of living of the population engaged in agriculture. Labour productivity, as one of the indicators for measuring the efficiency of input use, represents the amount of value produced in a given period consumed per unit of work (REHMAN, H. 2003).

One of the problems of expression in labor productivity in agriculture is a measure of labor input live, but also overall. The most appropriate way to measure the amount of work involved is time units. The amount of time spent should accurately reflect the time expenditure of labor. Net working time is generally monitors in hours, but does not take into account how productive time was used. The use of working time is a factor and an unchanged number of employees and under the same procedures can lead to higher labor productivity (ZOBORSKÝ, M. 2006).

In agriculture, through the technical progress and increase the proportion of materialized labor in the production process, labor productivity growth very quickly. Labor productivity in agriculture expresses the value of the gross value added attributable to the annual work unit (MELNÍK, M. 2013).

2 Data and Methods

The methodology of the paper consists of the indiciators and alghoritm creation.The first group of indicators are the management indicators and the second group are the economic indicators of labor productivity of grapevine. The indicators and created alghoritm is focused only to the slovak vine production and does not take into the consideration the competitiveness with some other countries. The paper provides the overview of situation in Slovakia within the vine production using the selected indicators.

2.1 Indicators of labor productivity of grapevine

The basis for the calculation of the indicators were the resulting calculations of the Research Institute of Agricultural and Food Economics which detects actual own costs per unit of output and subsequently evaluation of other economic indicators (income, profit and subsidies to labor force). The assessment of the present paper, we use time series data for 15 years (1999 – 2013). Indicators of labor productivity of grapevine are presented in Table 1.

Table 1 Management and economic indicators of labor productivity of grapevine

Management indicators
Number of hectares managed by one worker in the cultivation of grapevine
Production of grapevine by one worker (in tonnes)
Number of worked hours per 1 hectare of grapevine
Economic indicators
Revenues per one worker in the production of grapevine (in EUR)
Profit per one worker in the production of grapevine (in EUR)
Revenues for 1 euro labor costs invested in the production of grapevine (in EUR)

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Profit for 1 euro labor costs invested in the production of grapevine (in EUR)
Labor costs per 1 ton of grapevine for the year (in EUR)
The percentage of labor costs for the producer price of grapevine (in %)
Subsidies for one worker by the number of irrigate hectares (in EUR)
Subsidies for 1 euro labor costs invested in the production of grapevine (in EUR)

Source: Research Institute of Agricultural and Food Economics, own calculations

2.2 Evaluation of the impact of labor costs developments to production of grapevine

Rated years 1999 – 2013 were significantly different from each other in crops, labor costs and economic results. For an objective assessment of the development of labor in the production of grapevine have calculations, that affect future expected impact on employment, used the average values of the grapevine harvest and the amount of work that we compared with the productivity of wheat.

Table 2 provides an overview of inputs and indicators that entered to the various algorithms used for simulation calculations.

Table 2 Inputs and indicators entering to algorithms

Inputs	**Explanatory**
Population in the Slovak Republic in 2013	PO
Vine consumption per 1 inhabitant of the Slovak Republic	WC
The conversion of the amount of grapevine for vine making	C
The average harvest of grapevine	AHG
Harvested area fruiting vineyards in the Slovak Republic (1999 - 2013)	HAFV
Indicators	
Vine consumption for all citizens of the Slovak Republic	A
The need for self-sufficiency grapevine of the Slovak Republic	B
The average number of hectares of vineyards managed by 1 worker	C
The average number of hectares of wheat managed by 1 worker	D
Grapevine production in the Slovak Republic	E
Increasing the number of jobs in the production of wheat in the reduction of 1 job	F
Loss of labor, assuming that the area under vineyards will grow wheat:	
Harvested area fruiting vineyards in 1999	G
Harvested area fruiting vineyards in 2013	H
The difference catchment area fruiting vineyards	I
The loss of labor from the vineyards area	J
Compensation for loss of job with the loss of one job in the vineyards	K

Source: Research Institute of Agricultural and Food Economics, Statistical Office of Slovak Republic, own processing

In assessing the impact of examples of labor cost developments to production of grapevine and ultimately their impact on the formation, respectively job losses, were used the following relations:

(1) *<u>Impact: Relationship of amount of work to foreign trade</u>*

a.) The number of jobs in the self-sufficiency of the Slovak Republic in the viticulture

$$\frac{Indicator\ B}{Indicator\ C}$$

Where:

Indicator B – the need for self-sufficiency grapevine of the Slovak Republic

Indicator C – the average number of hectares of vineyards managed by 1 worker

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b.) The number of workers in the catchment area of vineyards (in 2013)

$$\frac{HAFV}{Indicator\ C}$$

Where:

HAFV – harvested area fruiting vineyards in the Slovak Republic (1999 – 2013)

Indicator C – the average number of hectares of vineyards managed by 1 worker

c.) The number of re-employed workers in the self-sufficiency of vine production in the Slovak Republic

$$\frac{Indicator\ B}{Indicator\ C} - \frac{HAFV}{Indicator\ C}$$

* i.e. the difference between the number of jobs in the self-sufficiency of the Slovak Republic in the viniculture and the number of workers in the catchment area of vineyards in 2013

d.) The creation or loss of one job in raising, respectively reducing imports of vine

$$\frac{Indicator\ A}{\frac{Indicator\ B}{Indicator\ C}}$$

Where:

Indicator A – vine consumption for all citizens of the Slovak Republic

(Indicator B/ Indicator C) is the number of jobs in the self-sufficiency of the Slovak Republic in the viticulture

(2) *Impact: Relationship of consumption and vine production*

The relationship is expressed as a proportion of the increased consumption of vine per capita 1 and formation, respectively loss of one job in raising or reducing imports of vine.

(3) *Impact: Comparison of relative labor productivity in the production of wheat to labor productivity grapevine production*

a.) The formation of one job in the production of wheat in releasing staff from vineyards

$$\frac{1}{Indicator\ F}$$

Where:

Indicator F – increasing the number of jobs in the production of wheat in the reduction of 1 job

b.) The increase in wheat production workers at the reduction of 100 jobs from the vineyard area

$$Indicator\ F * 100$$

(4) *The impact of the loss of vineyards on employment*

a.) Total loss of workers from the vineyard area in the years 1999 – 2013

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$$Indicator\ K * \frac{1}{Indicator\ F}$$

Where:

Indicator K – compensation for loss of with the loss of one job in the vineyards

(1/Indicator F) is the formation of one job in the production of wheat in releasing staff from vineyards

b.) Compensation for loss of jobs in the cultivation of wheat result of the release vineyard area

$$\frac{Indicator\ I}{Indicator\ D}$$

Where:

Indicator I – the difference catchment area fruiting vineyards

Indicator D – the average number of hectares of wheat managed by 1 worker

3 Results and Discussion

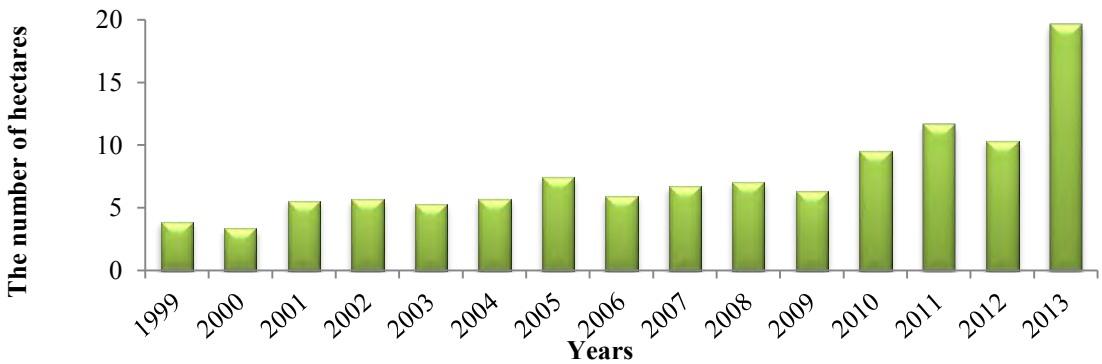
3.1 Eveluation of management and economic indicators of labor productivity

Grapevine is the most thermophilic plant grown in the temperate zone. Place of grapevine growing impacts on the quality of grapes and vine. The grapevine grown in our vine-growing areas is a valuable raw material for the production of high quality and high quality vines, as evidenced by the significant achievements Slovak vine producers in international exhibitions.

In assessing the yield per hectare vine from data of Research Institute of Agricultural and Food Economics can be argued, that lower yields per hectare associated with exceptionally unfavorable climatic conditions for growing vines.

From Figure 1, which shows the number of hectares of grapevine cultivated by one worker, we can see the stagnation of this indicator for us rated years. An exception is the 2013, which can be regarded as extremely difficult to care for vine. The course of the weather in terms of temperature and precipitation occurrence can be described as extremely extreme in its growing region.

Figure 1 Number of hectares managed by one worker in the cultivation of grapevine by the years



Source: Research Institute of Agricultural and Food Economics, Statistical Office of Slovak Republic, own calculations

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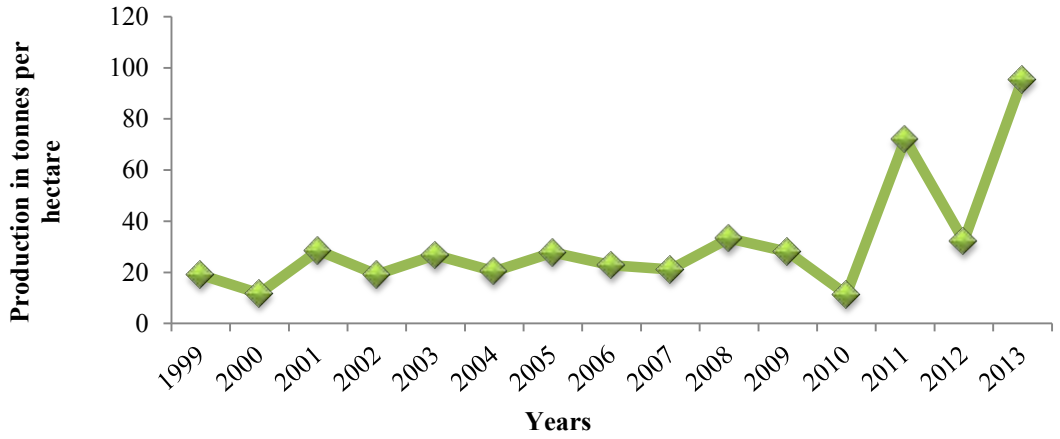
In that year labor productivity was the highest, when the average worker 1 cultivated for 19.61 hectares, which represents almost 6-fold higher productivity compared to the year 2000, when one employee managed about 16.24 hectares of grapevine less. Over the 15 years one employee operated each year 7.60 hectares of grapevine.

Average annual output per one employee in the vineyards for the period 1999 – 2013 was amounted for 31.34 tons of grapevine. Higher production in 2013 was due to high yield per hectare (5.30 tons) and one worker in the volume of production produced for 95.49 tons. The relatively low yield per hectare of grapevine in 2010 (1.19 tons) was the cause of the very low level of production of grapevine by one worker, when production was only 11.36 tons in total production of grapevine at 21 120 tons (Figure 2).

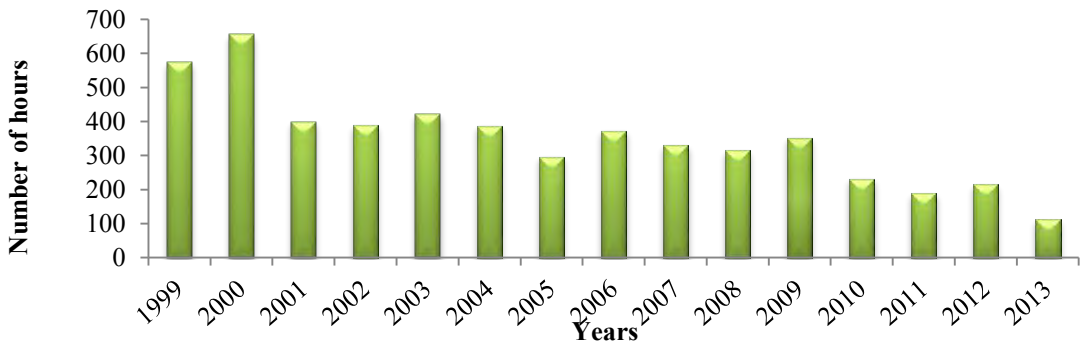
Figure 2 Production of grapevine by one worker in tonnes per year



Source: Research Institute of Agricultural and Food Economics, own calculations

The average need to work during the assessment period in grapevine amounted for 349.1 hours.* The lowest need for labor was recorded in the last evaluated year, i.e. in 2013, when the number of worked hours per 1 hectare cased on one worker came in at 112.7 hours. This constitutes a decrease of up to 543.7 hours compared to year 2000, which has the highest labor intensity (656.4 hours). Number of worked hours declined annually by an average of 30.7 hours (in relative terms a decrease of 80.32 %). For the foregoing and the number of worked hours per 1 hectare in the cultivation of the grapevine refers Figure 3

Figure 3 Number of worked hours per 1 hectare of grapevine



Source: Statistical Office of Slovak Republic, own calculations

* According to the Research Institute of Viticulture and vine in Bratislava, in the seventies was average need to work 1350 hours. hectares^{-1} per year, with a predominance of manual work. VEREŠ, A. (1976)

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The amount of revenues per one employee for the average of all years was 16 082 EUR, while the highest yield of 71 611 EUR is marked in 2013.

In the development of profit per one employee may be said that in 15 years had a predominance of loss, while the highest was shown in 2010, amounting to -18 351 EUR. The best profit was recorded in 2013, when the one worker has reached 27 731 EUR of profit. In the years 2001, 2003 and 2011, the profit was also positive, but the rest of the monitored years can be observed negative profit, i.e. one worker for us rated years accounted on average -1 134 EUR of loss.

Table 3 Development of revenues and profit per one worker and for 1 euro labor costs invested in the production of grapevine

Years	Grapevine			
	Revenues for one worker (in EUR)	*Profit for one worker (in EUR)*	*Revenues for 1 euro labor costs (in EUR)*	*Profit for 1 euro labor costs (in EUR)*
1999	4 713	-563	1,91	-0,23
2000	4 579	-760	1,59	-0,26
2001	8 908	720	2,33	0,19
2002	6 901	-1 912	1,72	-0,48
2003	10 387	1 319	2,53	0,32
2004	7 681	-4 770	1,63	-1,01
2005	7 186	-7 029	1,42	-1,39
2006	8 594	-6 118	1,57	-1,12
2007	8 893	-6 974	1,47	-1,15
2008	14 090	-8 300	2,11	-1,24
2009	8 094	-10 673	1,20	-1,58
2010	6 592	-18 351	0,93	-2,59
2011	48 126	20 428	6,20	2,63
2012	24 869	-1 763	3,12	-0,22
2013	71 611	27 731	8,55	3,31
Average	16 082	-1 134	2,55	-0,32

Source: Research Institute of Agricultural and Food Economics, Statistical Office of Slovak Republic, own calculations

The development of the amount of profit per 1 euro labor costs in the production of grapevine was fluctuating course for us rated years. One euro labor costs invested in the production of grapevine for the period 1999 – 2013 brought the average income 2.55 EUR of revenues and -0.32 of loss (Table 3).

Figure 4 Development of labor costs per 1 ton grapevine per year

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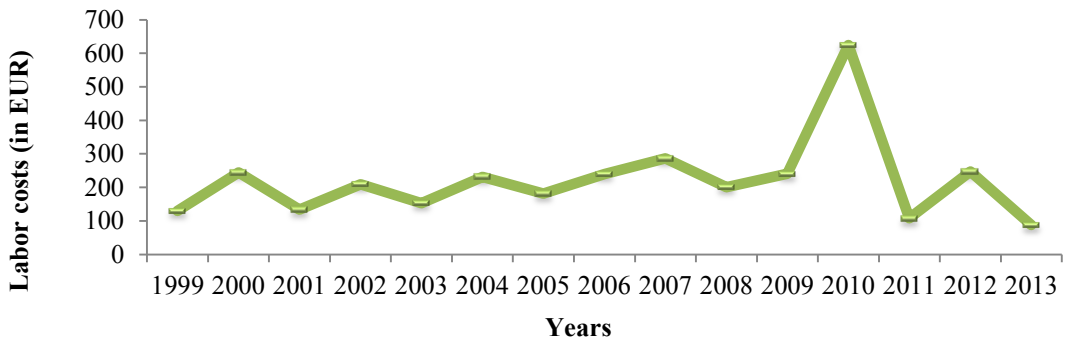

Source: Research Institute of Agricultural and Food Economics, own calculations

Labour costs per 1 ton of grapevine were in the range from 87.84 to 286.55 EUR with a significant increase occurred in 2010, when labor costs per 1 ton of grapevine stood at 624.78 EUR (Figure 4). This extreme increase caused a very low yield of grapevine brought about by adverse weather conditions. Average labor costs per 1 ton of grapevine for all the evaluated years were 221.34 EUR.

From the comparison of the relative labor costs producer of grapevine can claim that labor costs for the production of grapevine accounted for 75.69 % of the vine producers, resulting in a high labor content.

Table 4 Development of subsidies per 1 hectare of grapevine, subsidies for one worker and subsidies for 1 euro labor costs invested in the production of grapevine

Years	Grapevine		
	Subsidies per one hectare (in EUR)	*Subsidies for one worker (in EUR)*	*Subsidies for 1 euro labor costs (in EUR)*
1999	144,50	558	0,23
2000	203,04	684	0,24
2001	160,10	887	0,23
2002	178,54	1 014	0,25
2003	220,52	1 158	0,28
2004	118,75	679	0,14
2005	96,78	722	0,14
2006	115,64	686	0,13
2007	120,09	804	0,13
2008	247,29	1 741	0,26
2009	242,19	1 522	0,23
2010	255,00	2 433	0,34
2011	268,00	3 130	0,40
2012	296,57	3 057	0,38
2013	255,76	5 015	0,60
Average	194,85	1 606	0,27

Source: Research Institute of Agricultural and Food Economics, Statistical Office of Slovak Republic, own calculation

Data from the Research Institute of Agricultural and Food Economics shows that the average annual subsidies per 1 hectare of grapevine for the period of 15 years amounted to 194.85 EUR. Evaluated from the results it can be concluded that the subsidies grants for the

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production of grapevine does not cover labor costs in production. The average subsidies for production work of one worker in the assessment period amounted to 1 606 EUR (Table 4) and the average annual labor costs of one employee was 5.551 EUR. Subsidies for 1 euro labor costs invested in the production of grapevine were on average 0,27 EUR. If we compare the subsidy titles of grapevine on labor costs with other crops (densely sown cereals and oilseeds) can state a significant reduction in subsidies.

3.2 Evaluation of the impact of labor costs development on grapevine production

Rated years 1999 – 2013 were significantly different from each other in crops, labor costs and economic results. For an objective assessment of the development of labor in the production of grapevine have calculations, that affect future expected impact on employment, used the average values of the grapevine harvest and the amount of work that we compared with the productivity of wheat (as a carrier crops in crop production in crop rotation of the Slovak Republic).

Overview of inputs and indicators that entering into various algorithms used for simulation calculations shows Table 5.

Table 5 Inputs and indicators needed to evaluate the impact of labor cost developments to production of grapevine

Inputs	**Values**
Population in the Slovak Republic in 2013	5.414
Vine consumption per 1 inhabitant of the Slovak Republic	13
The conversion of the amount of grapevine for vine making	0.65
The average harvest of grapevine	4.06
Harvested area fruiting vineyards in the Slovak Republic (1999 - 2013)	10.039
Indicators	
Vine consumption for all citizens of the Slovak Republic	70.382
The need for self-sufficiency grapevine of the Slovak Republic	26.670
The average number of hectares of vineyards managed by 1 worker	7.6
The average number of hectares of wheat managed by 1 worker	298.06
Grapevine production in the Slovak Republic	40.758
Increasing the number of jobs in the production of wheat in the reduction of 1 job	0.02549
Loss of labor, assuming that the area under vineyards will grow wheat:	
Harvested area fruiting vineyards in 1999	22.847
Harvested area fruiting vineyards in 2013	10.039
The difference catchment area fruiting vineyards	-12.808
The loss of labor from the vineyards area	-1.685
Compensation for loss of job with the loss of one job in the vineyards	43

Source: Research Institute of Agricultural and Food Economics, own calculations

Examples of the impact of labor cost developments on grapevine production

(1) Impact: Relationship of amount of work to foreign trade

Slovakia currently needs to ensure self-sufficiency 70.382 hectoliters of vine, which would mean under current labor productivity 3.509 workers employed in the viticulture at self-sufficiency of the Slovak Republic. Currently, the size of the fruiting vineyards is 10.039 hectares on which works according to labor productivity 321 workers. It follows that if the Slovak Republic achieve self-sufficiency in the production of vine should be managed in the viticulture again employ 2.188 workers. It follows that if the Slovak Republic achieve self-sufficiency in the production of vine, so in the viticulture it can be re-employ 2.188 workers.

One worker employed in the vineyards has been produced on average 31.34 tons of grapevine with the largest quantity produced in 2013 (95.49 tons) and the smallest in 2009 (11.36 tons).

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Based on our calculations, it can be argued that if the import of vine increased or decreased by 20.37 hectoliters, create or disappear one job in the vineyards.

(2) Impact: Relationship of consumption and vine production

If vine consumption rises to 1 liter per capita (from 13 l to 14 l), increasing the total consumption of 5.414 hectoliters, what representing 270 jobs.

(3) Impact: Comparison of relative labor productivity in the production of wheat to labor productivity grapevine production

The assumption is based on the theory that if we eliminate vineyards and and on the surface will grow wheat.

One employee cultivated for us rated years 1999 – 2013 on average 298.06 hectares of wheat. In the viticulture one worker managed on average 7.6 ha of grapevine.

This means that one worker in agriculture by farmed area of wheat cases on 39 workers in the vineyards. From the foregoing, where 100 workers will decline in the vineyards and replaced the released area of production of wheat, so 2.5 workers will be enough for the production of wheat.

(4) The impact of the loss of vineyards on employment

In 1999, the area of fruiting vineyards was 22.847 hectares and in 2013 was 10.039 hectares, which represents a decrease of 12.808 hectares. According to our calculations, rated for the period from the viticulture released in 1.685 workers and when those assumptions were replaced by 43 employees in the cultivation of wheat.

4 Conclusion

The source of growing prosperity of every company is to increase the efficiency of using input of economic process. When evaluating the results obtained in commodity grapevine, we can conclude that labor productivity has significantly stagnated over the reporting period of 15 years. Effect of processing technology is reflected at least on labor productivity.

When analyzing the subsidy policy for one employee by the number of cultivated hectares, we found several times lower subsidies than in densely sown cereals. These facts are reflected by reduction of vineyards growing area. Farms that produce commodities with long-term economic loss and require more labor intensive are attenuated.

In recent years in crop production growing vineyards area are significantly reduced, which had according to our calculations a significant impact on employment in farming. According to our calculations, rated for the period from the viticulture released in 1.685 workers and when those assumptions were replaced by 43 employees in the cultivation of wheat.

Another serious problem is the amount per hectare yields that are above the European Union average of 20 – 50%. This fact is directly related to the production intensity in production and climatic conditions of the Slovak Republic, where for example the cultivation of the grapevine represents the northern border regions. Based on the findings, we recommend:

- Slovak producers in terms of competitiveness of traditional agricultural commodities (grapevine) should focus on the intensity of production (crops), which lag behind the developed producing countries of the European Union by 50 %. From the foregoing, it is clear that the hectare yield significantly affects competitiveness,

- One possibility to obtain the funds, is the total reduction of Single area payment scheme (SAPS) and this commodity should be favored by subsidy title to the densely sown cereals,
- Maximize complementary national direct payments to the state level,
- Subsidy direct support for investment in irrigation technologies and technological lines and creating the conditions for a competitive advanced states of the European Union, which have been increasing share of imports in (potatoes, vegetables, orchards, vineyards),
- Control of the recommendation plantings and subsidy titles that commodities should be approved by the Central Control and Testing Institute of Agriculture,
- The state should enter into negotiations with retail chains and prepare for placing on the market,
- By those measures, we promote the competitiveness of various sectors of agriculture which would have a significant impact on employment in the various regions of Slovakia and at the state level we have to reduce negative trade balance in the evaluation of traditional agricultural commodities.

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Price linkages between biodiesel and vegetable oils

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Abstract
Biodiesel can work as an alternative form of traditional fuels. Currently, crude oil market situation is unstable due to significant decrease in crude oil prices. Thus, volatile prices of crude oil put pressure on agriculture and food industry and low prices of crude oil may cause food prices to decrease. Additionally, lower oil prices have an impact on vegetable oils used in biodiesel production. Consequently, the diminishing trend in crude oil prices might seem to be beneficial for biodiesel producers due to the fact that rapeseed oil, soybean oil, palm oil belong to dominating feedstocks for biodiesel production. However, diesel prices would decline with lower crude oil prices, meaning that low diesel prices push down biodiesel prices. Therefore, this paper focuses on long-run relationship between biodiesel prices and prices of vegetable oils used for biodiesel production. The aim of the paper is to investigate price development and price linkages between biodiesel prices and selected prices of vegetable oils based on linear modelling technique called ordinary least-squares regression.

Key words: *biodiesel, ordinary least squares, price, vegetable oils*

JEL classification: *Q11, Q57*

1. Introduction

The production of biofuels has affected the relationship between food and crude oil prices and high crude oil prices and biofuel production are boosting the price of many food commodities (Bracco, 2014). Gerber, N. et al. (2008) show that the increasing demand for feedstock from the biofuel sector is one among several factors (e.g. poor harvest, the structural change in food demand, population growth, high oil prices, etc.) that have impact on agricultural prices. Baffes, J. (2013) reports that oil price movements explain most of the price rise in biofuel feedstock prices over the past decade, with demand side factors (biofuels, expanded population, changing diets and stocks all lumped together) altogether account for less than 10% of the price increase.

The large body of literature that relies on simulation to assess the impact of introduction of biofuel on food prices has applied several approaches (Goldemberg et al., 2004). The first is *partial-equilibrium elasticity analysis* that assesses the impact of biofuel on food prices by using elasticities to assess the price changes resulting from the diversion of the supply from food commodities because of biofuel. A simple graph of this approach is provided in Figure 1. The initial demand, before biofuel, is D_F then, after biofuel, the total demand is $D_{F+}B$. The initial supply is S_0 but, after some adjustments, the supply may move to S_1. The introduction of biofuel may lead to an increase in price from P_A to P_B but, if supply is adjusted, then the price change is from P_A to P_C. In the case of sugarcane, for example, the introduction of biofuel leads both to increased demand for sugarcane as well as an increase in supply. Thus, the percentage price increase due to the introduction of biofuel on sugarcane is $(P_C-P_A)/P_A$. When there is substitution among crops (corn, soybeans), multimarket analysis is required.

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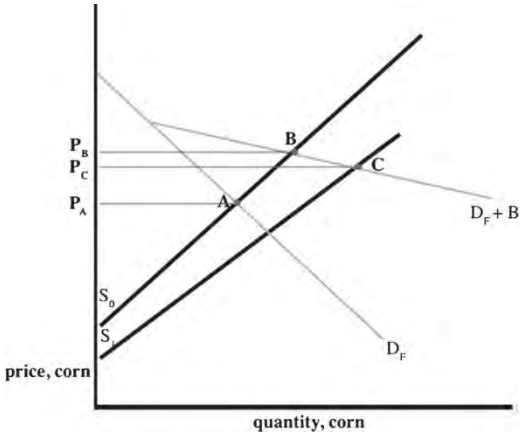
Figure 1: Biofuel and the food market



Source: Goldemberg et al., 2004

Chakravorty et al. (2010) perform a multimarket model to assess the future impacts of biofuel on fuel and food, emphasizing heterogeneity of land productivity and multiple crops and the relationship between crops and livestock. They argue that, while biofuel standards are important contributors to the rise of food prices, they are not the dominant one. They suggest that, with rising income, populations in developing countries will increase their consumption of animal products, which will further increase the demand for cereal. Thus, they expect that two-thirds of the increase in food prices will come from increased food demand and biofuel mandates will contribute only one-third.

Kristoufek, Janda, and Zilberman (2011) analyse correlations between a wide array of food and fuel commodity prices in the United States and European Union (EU) between 2003 and 2008. The results indicate that the dynamic interaction between different commodities varies significantly when analyzing weekly, monthly, and quarterly data. For the less-noisy quarterly data, a time series of commodity prices produced at closer proximity are more correlated. There are significant dynamic linkages between food prices and fuel prices with biofuels linking these markets. Saghaian (2010) show strong correlation among oil and other commodity prices (including food) but the evidence for a causal link from oil to other commodities is mixed. Gilbert (2010), based on quarterly data and Granger causality tests, found correlation between the oil price and food prices both in terms of levels and changes, but he also explains that it is the result of common causation and not of a direct causal link. In a recent study, Jansson and Wilhelmsson (2013) examine the detailed plans of the member countries for the expansion of biofuel production to achieve the EU targets. They conclude that, while these only involve a limited expansion in land use within the EU, there is, in addition to reallocation of land, a substantial increase in imports of primary agricultural products. They argue that the expansion of biofuels in Europe establishes a closer link between agricultural and fuel prices and leads to increases in prices of primary agricultural products, particularly vegetable oils used for biofuels.

2. Data and methodology

The main goal of this paper is to investigate long-run relationships among biodiesel price and prices of selected vegetable oils representing feedstock for biodiesel production, mainly rapeseed oil, soybean oil and palm oil. More specifically, the paper intends to find out if the relationships among the variables are statistically significant. Linear modelling technique called ordinary least-squares (OLS) regression is performed in order to investigate price

linkages. The paper also outlines price development and relationship of biodiesel price and crude oil price.

Monthly biodiesel and crude oil prices in Euros per 1000 litres are collected for period July 2005 - December 2015. The time period is divided into two sub periods to investigate whether the effects of vegetable oils price changes and crude oil price changes have become more prominent over the time (the unstable situation in oil crude market after 2013 caused again a decrease in prices of vegetable oils). The data are taken from UFOP. The crude oil price are taken from IndexMundi representing simple average of three spot prices: Dated Brent, West Texas Intermediate, and the Dubai Fateh. Prices of the chosen vegetable oils are taken from IndexMundi database as a world market commodity price and the prices are expressed in Euro per metric ton. Logarithmic transformation of the prices is used and one lagged independent variables are included in the equations to allow for the possibility that time might elapse between a change in the independent variable and the resulting change in the dependent variable. We assume that examined economic situations do not imply such instantaneous relationships between the dependent and independent variables.

The following hypothesis is formalized and reviewed in order to fulfil the main aim:

1) There is an evidence of a long run relationship between biodiesel price and prices of vegetable oils.
2) There is an evidence of a long run relationship between biodiesel price and crude oil price.

P-value determines if the relationships among the selected variables: biodiesel price and chosen commodity prices (rapeseed oil, soybean oil, palm oil and crude oil) are statistically significant. If P-value is lower than significance level alpha (0.05), H_0 hypothesis is rejected and H_1 hypothesis: is accepted, meaning that there is statistically significant relationship between our two examined variables. P-value stands for probability value, it is compared with the level of significance-alpha. If the P-value is > 0.05 – the referring coefficient is not statistically significant (-); if the P-value is <0.05 – the referring coefficient is statistically significant at the 0, 05 level of significance (+) and if P-value is <0.01 – the referring coefficient is statistically significant at the 0.01 level of significance (++) Cohen et al. (2002).

Montgomery et al. (2012) state that simple linear regression model is a model with a single regressor x that has a relationship with response y that is a straight line. This simple linear regression model is

$$y = \beta_{0+}\beta_1 x + \varepsilon \qquad (1)$$

where the intercep β_0 and the slope β_1 are unknown constants and e is a random error component. The errors are assumed to have mean zero and unknown variance σ^2.

Tests for heteroscedasticity and normality of residuals are used for diagnostic checking in regression relationships. According to Crown (1998), Breusch and Pagan (1979) presented a test for heteroscedasticity that can identify a broad range of functional forms for nonconstant error variance. In addition, their approach leads to a WLS specification for correcting heteroscedasticity with a broad range of functional forms. White test does not require additional structure on the alternative hypothesis and exploits further the idea of a heteroskedasticity-consistent covariance matrix for the OLS estimator. The White test is a generalization of the Breusch-Pagan test, which also involves an auxiliary regression of squared residuals, but excludes any higher-order terms (Verbeek, 2008).

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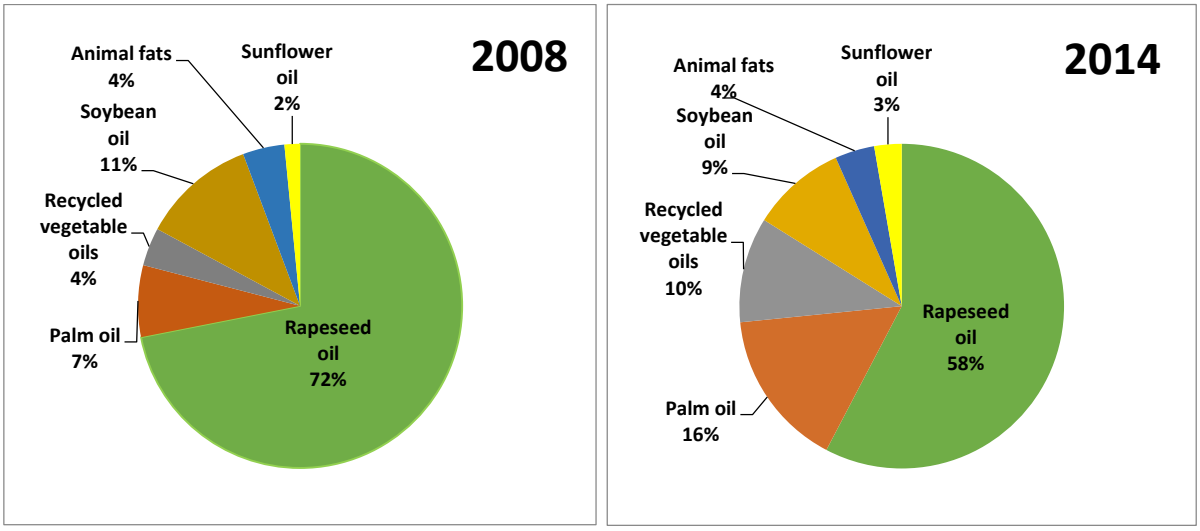
3. Results and discussion

3.1. Feedstock for biodiesel

Biodiesel is produced from vegetable oils, which are derived from the seeds or the pulp of a range of oil-bearing crops. These oil crops can be annual (rapeseed, sunflower, groundnut, and soybean) or perennials (oil palms, coconut palms, physical nut, Chinese tallow tree). Oil from the rapeseed was the first type used for biodiesel production.[1]

Suitable climatic, soil and rainfall conditions for growing rapeseed in European fields, mainly in Germany, mean that rapeseed oil have been a key oil crop for biodiesel production since its inception in EU. Sunflower oil is also one of the options for biodiesel production at a large scale, however, due to its high price it is not the main common feedstock. Soybean oil as a feedstock for biodiesel production is mainly used by producers in US, Brazil and Argentina. Palm oil recorded the most significant increase by 11 per cent as a feedstock for biodiesel production during the time period 2008-2014 (Figure 2).

Figure 2: Comparison of feedstock for biodiesel production in EU-28 in 2008 and 2014



Source: Own calculation; data based on EU FAS Posts

The price of vegetable oils used for biodiesel production recorded a strong fluctuations on the commodity markets during period 2005-2015. Time series plot depicts that all price series recorded twice a rapid drop down and a sharp rise during the examined period. More specifically, a significant increase was shown during period 2005-2009. Due to the worldwide economy crisis, prices started to fall in 2009. Afterwards, the prices gradually increased, moreover prices of soybean and palm oil reached historic maximums in their price level in 2011 and 2012. The unstable situation in oil crude market after 2013 caused again a decrease in prices of vegetable oils (Figure 3). The month-on-month drop in vegetable oils price, mainly mirrors developments in the market for palm oil, the most widely traded vegetable oil. The recent slump in crude oil prices depressed demand for palm oil as a biodiesel feedstock, causing a sizeable drop in palm oil values. For year 2014 was characteristic two following factors: first, continued weakness in soybean oil prices due to abundant supply prospects in 2014/2015: and second, the recent setbacks in crude oil prices, which tend to reduce demand for vegetable oils as biofuel feedstock (FAO, 2014).

[1] http://www.eubia.org/index.php/about-biomass/biofuels-for-transport/biodiesel

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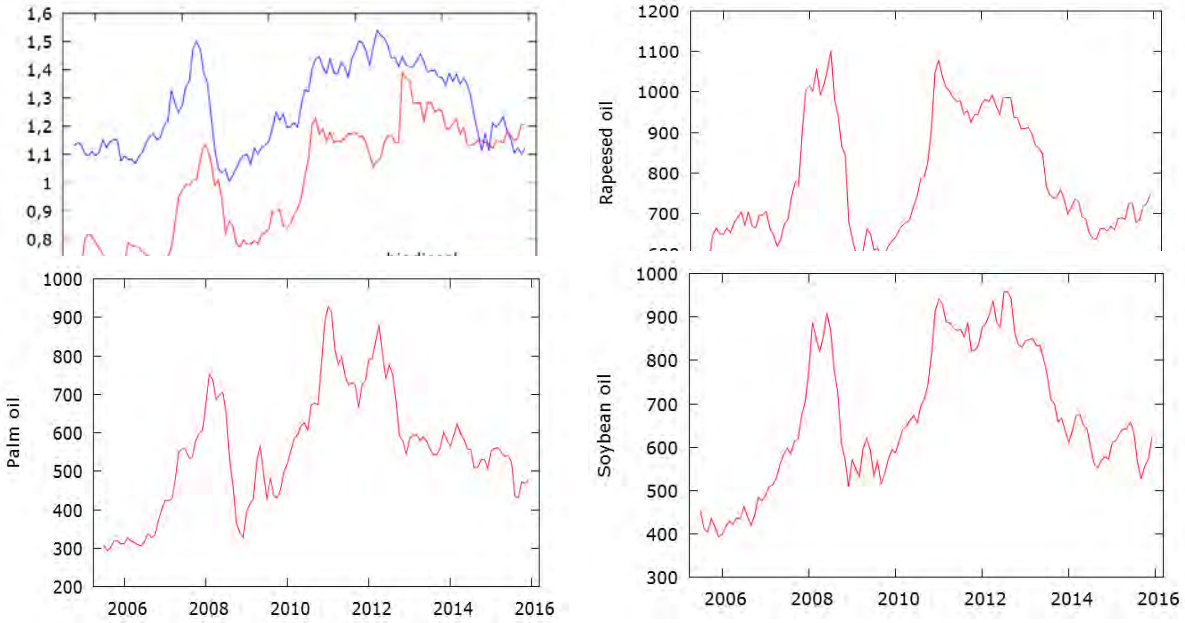
Figure 3: Development prices of selected vegetable oils



Source: Own calculation; data based on UFOP, index mundi

Table 1. Descriptive statistics

Variable	Mean	Min	Max	Skewness	Median	C.V	Ex.kurtosis
Biodiesel	98,856	64,81	139,01	0,0268	100,22	0,2035	-1,3798
Rapeseed oil	789,02	542,48	1101,2	0,3641	736,6	0,1946	-1,3369
Diesel	127,24	100,62	154,01	0,0109	127,34	0,1181	-1,4420
Palm oil	556,36	293,12	927,3	0,181	557,8	0,2738	-0,4775
Soybean oil	673,46	393,07	958,56	0,0594	649,06	24625	-1,2385
Crude oil	53,203	25,956	74,832	-0,1856	51,941	0,2308	-1,1552

Source : Own calculation

Table 2. Correlation matrix

Variable	Biodiesel	Rapeseed oil	Palm oil	Soybean oil	Crude oil
Biodiesel	1.0000				
Rapeseed oil	0.8833	1.0000			
Palm oil	0.7890	0.8063	1.0000		
Soybean oil	0.9060	0.9027	0.9369	1.0000	
Crude oil	0.8268	0.8565	0.7711	0.8607	1.0000

Source: Own calculation

Correlation analysis revealed positive correlation between examined price series. The null hypothesis that the two variables are linearly independent or uncorrelated is rejected for all performed cases. It is also clear that that the vegetable oil prices (rapeseed, soy and palm) are correlated with each other (Table 2). Descriptive statistics of examined variables is shown in Table 1.

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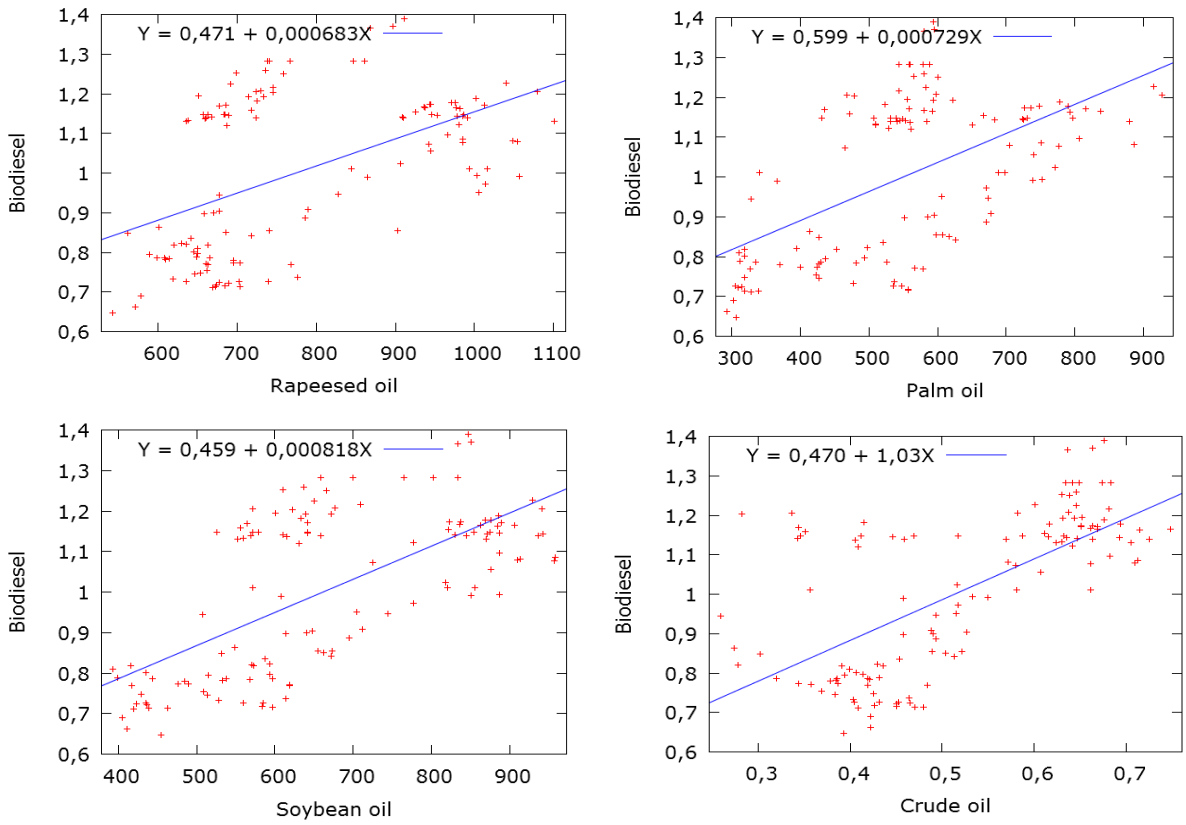
Scatter diagrams (Figure 4) show the development of the monthly biodiesel prices and prices of selected vegetable oils in July 2005 – December 2015.

Figure 4 Relationship between biodiesel price and diesel and selected vegetable oils



The results based on OLS show that prices of vegetable oils have a significant positive effect on the biodiesel prices. The coefficients of all vegetable oil prices and intercept are statistically significant at even 1% level of significance in all examined equations during the period 2005-2012 (Table 3, Table 4, and Table 5). One percent increase in rapeseed oil price is associated with 0.79% increase in biodiesel price. The l_palm_oil_1 coefficient (0.44) and l_soybean_oil_1 coefficient (0.60) show that biodiesel price rose by 0.44% for every 1% increase in palm oil price and by 0.60% for every 1% rise in soybean oil price. The findings are consistent with the strong upward trend in prices of vegetable oils from 2005-2008, reflecting increasing demand for biofuels. R-squared is also high (0.80) signifying a strong positive relationship between the biodiesel and rapeseed oil price and 83% of variance is explained by the model with soybean oil price series for the observation period (7/2005 - 12/2012). The regression model accounts for 65% of variance in equation with palm oil prices. The null hypothesis that the residuals are normally distributed is accepted for all examined equations. The Breusch-Pagan test reveals homoskedasticity at 5% significant level, except the equation with l_ soybean_oil-1 where the null hypothesis is rejected at the 5 % but not at the 1 % level. White´s test for heteroscedasticity confirms the null hypothesis for equations with the following variables: l_soybean oil_1 and l_rapeseed_oil_1. Therefore, the model is considered to be valid and reliable.

The results obtained for the second period 2013-2015 prove vegetable oils prices to be significant as well (Table 3, Table 4 and Table 5). If rapeseed oil is increased by 1%, then biodiesel price is expected to increase by 54%. The variable l_palm_oil_1 has a coefficient

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equal to 0.32 which means that 1% increase in palm oil price will lead to a 0.32% increase in biodiesel price. Soybean oil price has also a positive effect on biodiesel price, as its regression coefficient is 0.36. Additionally, diagnostic checks were computed in order to consider the model stable and reliable. Adjusted R- squared value decreases to 0.19 and the regression explains less of variation in biodiesel price in case of equation with palm oil price variable than the first. R-squared is higher (0.87) for the second observed period signifying that 89% of variance is explained by the model with rapeseed oil variable for the observation period 2013 – 2015. Additionally, R-squared value indicates that 70% of the variation in the biodiesel price variable is explained by the soybean oil price. The Breusch Pagan test and White´s test are again computed in order to test the heteroskedasticity and the null hypothesis of homoscedasticity cannot be rejected in all cases. The null hypothesis that the residuals are normally distributed is accepted for all examined equations as well.

The crude oil price proved to have a significant effect even at 1%- level during the both examined periods (Table 6). Heteroskedasticity is corrected in OLS model with variable l_crude_oil_1 for the period 2005-2012, due to the fact that the null hypothesis: heteroskedasticity is not presented was rejected in OLS model without heteroscedasticity correction. The coefficient of crude oil price equals to 0.71 which means that one percent increase in crude oil price leads to an increase of 0.71 in biodiesel price. When comparing the value to the results of regression covering the second period, it is evident that changes in crude oil price had smaller effect on the biodiesel price in 2013-2015. The adjusted R-squared value decrease to 0.27 and the regression explains less of the variation for the period 2013-2015 in comparison to the period 2005-2012 (R^2 = 0.64). The null hypothesis that the residuals are normally distributed is accepted and White´s test indicates that the null hypothesis of homoscedasticity is accepted in the second examined period.

Table 3: OLS model with independent variable l_rapeseed_oil_1

	2005:07-2012:12			2013:01 -2015:12		
	Coefficient	*Std. Error*	*t-ratio*	*Coefficient*	*Std. Error*	*t-ratio*
const	1.52956***	0.281607	5.432	3.53914***	0.239379	14.78
l_rapeseed_oil_1	0.793414***	0.0422500	18.78	0.539751***	0.0363282	14.86
R-squared	0,802116			0.869950		
Adjusted R-squared	0.799841			0.866010		
White´s test	2.71565 (0.25722)			6.462826 (0.039502)		
Breusch-Pagan test	0.864941(0.35236)			1.936148 (0.164087)		
Test for normality	7.40682 (0.0246393)			2.08673 (0.352267)		

Source: Own calculation

Table 4: OLS model with independent variable l_palm_oil_1

	2005:07-2012:12			2013:01 -2015:12		
	Coefficient	*Std. Error*	*t-ratio*	*Coefficient*	*Std. Error*	*t-ratio*
const	4.06576***	0.214636	18,94	5.10198 ***	0.659330	7.738
l_palm_oil_1	0.438230***	0.0341599	12,83	0.316213***	0.104582	3.024
R-squared	0.654183			0.216936		
Adjusted R-squared	0.650208			0.193207		

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Test for normality	0.748924 (0.687659	4.0953 (0.129038)
White´s test	12.9149 (0.0015688)	2.296564 (0.317181)
Breusch- Pagan test	0.231346 (0.630528)	1.513334 (0.218631)

Source: Own calculation

Table 5: OLS model with independent variable l_soybean_oil_1

	2005:07-2012:12			2013:01 -2015:12		
	Coefficient	*Std. Error*	*t-ratio*	*Coefficient*	*Std. Error*	*t-ratio*
const	2.92343***	0.190634	15.34	4.76542***	0.264262	18.03
l_ soybean _oil_1	0.601774***	0.0294496	20.43	0.359345***	0.0407485	8.819
R-squared	0.827569			0.702080		
Adjusted R-squared	0.825587			0.693052		
Test for normality	1.02585 (0.598742)			2.86136 (0.239146)		
White´s test	6.233984 (0.044290)			0.267708 (0.874718)		
Breusch_Pagan test	5.183104 (0.022808)			0.112752 (0.737033)		

Source: Own calculation

Table 6: OLS model with independent variable l_crude_oil_1

	2005:07-2012:12			2013:01 -2015:12		
	Coefficient	*Std. Error*	*t-ratio*	*Coefficient*	*Std. Error*	*t-ratio*
Const	2.41378***	0.279887	8.624	6.29326***	0.216968	29.01
l_ crude _oil_1	0.709501***	0.0441130	16.08	0.127455***	0.0344507	3.700
R-squared	0.639523			0.293168		
Adjusted R-squared	0.635380			0.271749		
Test for normality	8.40516 (0.0149569)			1.26676 (0.530795)		
White´s test	-			4.715149 (0.094649)		

Source: Own calculation

4. Conclusion

The main goal of the paper was to explore links between price of biodiesel and prices of selected vegetable oils representing feedstock for biodiesel production; mainly rapeseed oil, soybean oil and palm oil. The paper also focused on the price development and relationship of biofuel and crude oil prices. The stated hypotheses were confirmed due to the fact that the research confirmed that there was an evidence of long run relationships among biodiesel price and vegetable oils prices, and between biodiesel price and crude oil price. The results showed that prices of vegetable oils had a significant positive effect on the biodiesel prices during the period 2005-2015. Moreover, the crude oil price proved to have a significant effect even at 1%- level during the both examined periods. Unstable situation in oil crude market after 2013 caused again a decrease in prices of vegetable oils. According to the obtained results, these price changes have been also reflected in biodiesel sector, thus, making producing biofuel more profitable if price of vegetable oils are cheaper than gas oil. The findings are in line with e.g. Demirbas (2005) who states that costs of biodiesel varies depending on the base stock,

geographic area, variability in crop production from season to season, and the price of crude oil. Moreover, high price of biodiesel is due to the high price of feedstock. Knothe et al. (2009) explain that economic reasons have been one of the major obstacles in the use of biodiesel due to the fact that the feedstock for biodiesel is more expensive than conventional diesel fuel (in US, a gallon of soybean oil costs approximately two to three times as much as a gallon of conventional diesel fuel).

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Future possible uses of renewable energy in the V4 countries

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Abstract
Nowadays the number of the population of the World is over 7.3 billion, which was less than 4 billion at the beginning of the 1970s. That was one of the reasons why in the last 40 years the utilisation of fossil minerals increased rapidly. The stocks of these resources are limited, so we need to find another way which helps us to substitute them in the future and also to increase our efficiency and sustain our natural environment. The use of the limited resources has also increased in Europe and it holds true in the V4 countries, too. That is the reason why this question is also important in the V4 countries, but the natural possibilities are different. The goal of the countries is to find those alternative or renewable energy sources which could be suitable for solving this problem, and boost the economy instead of destroying their natural environment. In this paper I compare the energy utilisation of V4 countries in the past, the structure of the fossil and renewable energy usage nowadays and examine those possibilities (wind energy, solar energy, geothermal energy, biomass), which can help them reduce their energy dependency from other countries. These countries need to increase the ratio of the utilisation of renewable- and alternative resources in the future if they want to satisfy their population demand.

Keywords: *fossil minerals, renewable energy, V4 countries, sustainability, energy dependency*

JEL Classification: *Q42, Q43, Q35, Q01, P28, P18*

1. Introduction

Within just a few years we need to generate more than one third of our power from renewable sources of electricity. A significant part of our heating and transport must be based on renewable fuels. It is not enough to tinker around the edges. We need huge practical and concrete initiatives involving society as a whole, and need to persuade international partners to follow the same way.

Despite the strong efforts of the European Union and its member state to promote higher use of renewable sources of energy, conventional energy sources as gas, oil or coal still hold the primacy in the energy mix of almost all the member states. The limited supplies, uneven distribution and rising costs of fossil fuels push the states intensively towards ensuring their national energy security.

The V4 countries are among those in the European Union, which are dependent on imports of strategic energy sources such as oil or gas, as their home production is far from being able to secure sufficient supplies for the consumers. Furthermore the V4 countries and especially Slovakia, but also Austria in the case of gas, relies on energy imports primarily from only one country, Russia.

This single-track dependency can lead to situations as those in January 2009 when the gas crisis caused by Russia‘s suspension of supplies due to the conflict between the Russian gas company Gazprom and the Ukrainian company Naftohaz Ukrainy over supplies, prices and debts. In order to prevent similar situations the V4 countries are intensively trying to ensure diversification of both, transport routes for oil or gas and alternative suppliers.

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2. Data and Methods

In the following sessions, the paper focuses on V4 countries pursuit of sustainable development, who has different opportunities, production, consumption of the fossil, and renewable energy sources, however, the motivation and the future goals have become the same for both.
The methodological approach is mainly descriptive. The analysis will be based on relevant statistical data from secondary sources from national and international literature.

3. Results and Discussion

The primary energy production is based on the natural resources of the countries. In all of these countries the consumption of the primary energy sources is higher than the production, but the level of the difference is not the same. Comparing the V4 countries the best situation is in Poland whose stocks are the biggest in the region, but in the last 15 years the difference between the production and consumption increased by nearly 30 percent. In Hungary and Slovakia the consumption of the primary energy sources is more than 2.5 times exceeded the production which is not good. (Table 1)

Table 1: Total primary energy production and consumption in the V4 countries 2000-2012 (Quadrillion Btu)

	2000		2005		2010		2012	
	P[x]	C[x]	P	C	P	C	P	C
Czech R.	0.814	1.396	0.895	1.541	1.021	1.601	1.064	1.572
Hungary	0.453	1.022	0.399	1.157	0.402	1.053	0.370	0.951
Poland	3.057	3.624	2.966	3.673	2.501	4.049	2.694	3.905
Slovakia	0.284	0.785	0.146	0.819	0.250	0.769	0.255	0.698

Source: www.eig.gov, HSY 2015
[x] P=Production, C=Consumption

Analysing the primary coal production of the V4 countries we can see that the stocks covered the consumption in Czech Republic (role in Total Primary Energy Sources TEPS reach 40.38%) and Poland (51.8% in TPES), but in the other two countries the consumption is higher than the production. In 2012 the Slovak consumption (18.67 in TPES) was more than 3 times bigger than production which means the high ratio of import coal. (Table 2)

Table 2: Total primary coal production and consumption in the V4 countries 2000-2012 (Thousand Short Tons)

	2000		2005		2010		2012	
	P[x]	C[x]	P	C	P	C	P	C
Czech R.	71829	67045	68372	62148	60858	56886	60597	54952
Hungary	15469	16579	10549	12925	10045	11822	10240	12021
Poland	179247	158488	174988	150166	146257	147871	158197	146661
Slovakia	4021	9897	2768	9290	2621	8415	2526	7701

Source: www.eig.gov, HSY 2015 [x] P=Production, C=Consumption

Natural gas role varies amongst V4 states, with its portion in the energy-mix being the lowest in Poland, 13.88% in 2012, whilst the highest in Hungary, reaching 35.27%. (Eurostat 2014) A relatively low level of domestic natural gas production is a common feature of V4 states, resulting in high-dependency upon imports. (BP 2014)

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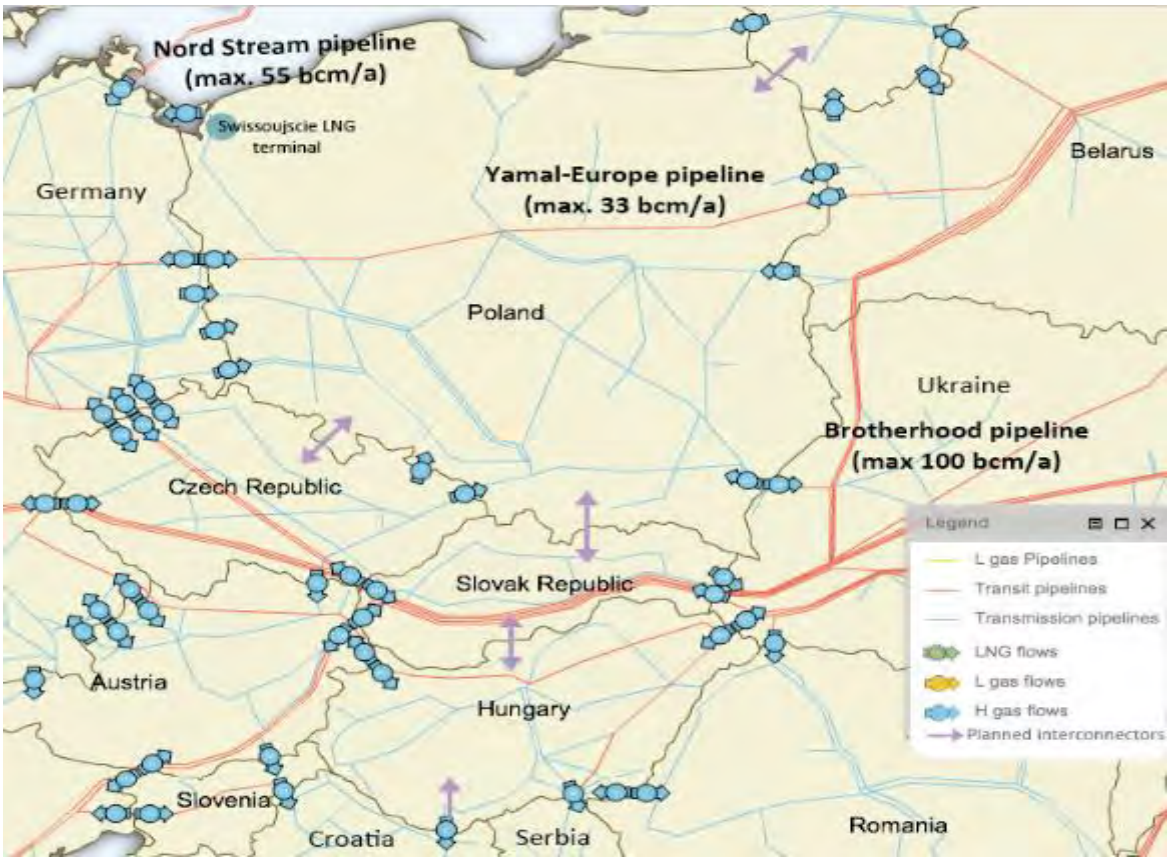
As the Czech Republic is a landlocked country, natural gas is transported there via pipelines; it has two main suppliers: historically Russia, and after signing the deal to diversify imports – Norway. (Kalan 2013)

Three pipelines deliver Russian gas to the region, thus transport-related risks can be significantly reduced if the individual markets are integrated into one complex entity.

Figure 1: Major existing and planned natural gas pipelines



Source: (BDEW & Eurogas 2012), (IEA 2014) and (Gazprom 2014b)

In 2013, total imports amounted to 11 bcm, of which 7.2 bcm (65.45%) originated from Russia, whilst 3.8 bcm (32.54%) from Norway. (BP 2014) Importation is executed through the Yamal-Europe and the Nord Stream/OPAL/Gazelle pipeline systems. (IEA 2010) The Czech Republic has one of the largest natural gas storage capacities in the region, with 10 facilities capable of storing a total of 3.2 bcm. (Kalan 2013)

The consumption of natural gas in Hungary amounted to 8.6 bcm in 2013, which was 37.75% of TPES. Consumption has shown a declining trend in recent years and according to the estimates of the government domestic consumption will stabilize between 8-9 bcm/year. (IEA 2011a) As domestic production is relatively low (approximately 2 bcm/year), dependency on imports is high, with Russian supplies amounting to 5.9 bcm (68.6% of total gas consumption) in 2013. (Eurostat 2014) (BP 2014) Hungary's storage capacities totalling 4.4 bcm. (IEA 2011a)

Poland, as the largest economy by GDP of the V4, also consumes the most energy. TPES reached 97 974.4 TOE in 2012. Petroleum products are the second most important source of energy in the country, whilst natural gas is third. (Eurostat 2014) Consumption of the latter amounted to 16.7 bcm in 2013, and with domestic production only reaching 4.2 bcm, the economy is heavily reliant on imports. It imported 11.4 bcm in 2013, of which 9.6 bcm

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originated from Russia, whilst the remaining 1.8 bcm from European countries other than the Netherlands, Norway and the UK. (BP 2014) Gas consumption within the country is projected to increase by 28% between 2009-2020 and 52% by 2030. (IEA 2011b)

Slovakia's gross inland consumption in 2013 amounted to 16.6 MtOE, of which the largest portion was produced with the use of natural gas (29.52%), play major roles in TPES. Domestic production of natural gas is nearly non-existent, 0.2 bcm in 2012 (IEA 2014b), thus the economy has been heavily reliant on Russian imports, with 2013 figures reaching 5.3 bcm. (BP 2014) The Brotherhood pipeline running through Slovakia is of key importance in transiting Russian gas to Western Europe. Its full capacity amounts to 90 bcm/a; however its utilization varies.

Table 3: Natural gas production and consumption in the V4 countries 2000-2014 (Million Cubic Feet)

	2000		2005		2010		2012	
	P[x]	C[x]	P	C	P	C	P	C
Czech R.	7.7	326	7.1	335	7.2	328	8.7	265
Hungary	113	425	107	529	102	428	65	295
Poland	184	473	214	573	215	606	215	631
Slovakia	6.1	252	5.2	255	3.7	215	3.5	142

Source: www.eig.gov, HSY 2015 [x] P=Production, C=Consumption

The situation is the worst in the oil sector where the consumption is 6-13 times higher than production in the V4 countries. That was the same in the past and nowadays too. The reason of this is the bad natural circumstances. So both of the V4 countries decided to build up an additional transport capacity for oil for the case of problems at then the only one route – oil pipeline Brotherhood.

Table 4: Oil production and consumption in the V4 countries 2000-2014 (Thousand Barrels/day)

	2000		2005		2010		2012	
	P[x]	C[x]	P	C	P	C	P	C
Czech R.	9.4	170	18	213	10	201	11	200
Hungary	49	143	42	155	34	149	25	139
Poland	23	411	39	471	29	568	39	514
Slovakia	3.2	67	13	78	7.7	84	9.1	73

Source: www.eig.gov, HSY 2015 [x] P=Production, C=Consumption

What would be the solution?

One of the biggest task for the European countries – included V4 – how will they substitute the fossil minerals.
The EU Renewables Directive is a unique creation which addresses two of the biggest challenges of our time – energy security and climate change. The 20% renewables target for 2020 is now firmly embedded in the psyche of Europe's decision makers.

What would be these resources?

Wind power is the harnessing of wind energy by wind turbines and the conversion to useful forms such as electricity or mechanical energy. We are all aware of the large-scale wind farms and have probably seen them from the highway at some point. These large scale wind farms are typically connected to the local network with smaller turbines used to provide electricity

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to more isolated areas. Wind farms installed on agricultural land or grazing areas, have one of the lowest environmental impacts of all energy sources. The number of the produced energy increased in a rapid way in the last 10 years and now it is 5100 MW in Poland, 329 MW in Hungary, 282 in Czech Republic and the role of this energy is very low in Slovakia – 3 MW.

Solar power harnesses the suns direct energy to produce electricity. This is by far the most advanced of our renewable energy efforts with new technologies developing at a rapid rate. Photovoltaic (PV) solar cells are becoming more efficient, lightweight, flexible and cheaper to manufacture. Germany is by far the world leader when it comes to solar energy production. In 2012 Czech Republic had a solar energy production of 2149GWh, Hungary had 8GWh, Poland had 1GWh and Slovakia had 424GWh.

Hydroelectricity is the production of power through use of the gravitational force of falling or flowing water. It is the most widely used form of renewable energy. There is no direct waste once a hydroelectric complex has been constructed. Small scale hydro power systems can be installed in small rivers or streams with little or no environmental effect or disruption to fish migration. This has become a popular alternative energy source, especially in remote areas where other power sources are not viable.

The majority of small-scale hydro power systems make use of water wheels to generate energy, skipping the need for a dam or major water diversion. Many hydroelectric projects are plugged into the national grid; however, some are created to serve specific industrial enterprises. Dedicated hydroelectric projects are often built to provide the substantial amounts of electricity needed for aluminium, electrolytic plants.

In 2012 Czech Republic had a hydro energy production of 2108GWh, Hungary had 211GWh, Poland had 2017GWh and Slovakia had 4062GWh.

Biomass is the harnessing of dead biological matter that can be used as fuel or for industrial production. In this context biomass refers to plants or produce such as trash, dead trees and branches, wood chips and even plant or animal matter. Biomass can also include biodegradable wastes that can be burnt as fuel.

Biomass reduces environmental pollution as it uses organic garbage. Biomass is an essential energy form for developing nations, for its potential as a low-cost, indigenous supply of power and environmental benefits.

In 2012 Czech Republic had a biomass and waste energy production of 3343GWh, Hungary had 1655GWh, Poland had 10103GWh and Slovakia had 928GWh.

In the last 15 years the ratio of the renewables increased in every V4 countries which I summarize in the Table 5.

Table 5: Total Electricity Generation from renewables in the V4 countries 2000-2012 (Billion Kilowatt hours)

	2000	2005	2010	2012
Czech R.	2.5	3.1	5.9	8.0
Hungary	0.3	1.9	3.2	2.6
Poland	2.6	4.1	11	17
Slovakia	4.6	4.7	5.9	5.4

Source: www.eig.gov, HSY 2015

4. Conclusion

V4 Member States have been, and will remain to be, vulnerable to energy-supply disruptions in the near future. The prominent role of natural gas in TPES, paired with the low domestic production has led to strong import-dependency, which, due to the lack of alternative energy sources, leaves Russia as the primary regional supplier. V4 cooperation has helped subduing the risks related to dependency; however the region is far from being fully interconnected. Further actions are necessary and they must be backed by political motivation. The aforementioned developments have helped each state on a national level; however, to achieve real interconnectivity, the North-South Corridor must be constructed and the HU-SK interconnector must be put to use without further delay. This would strengthen the V4's integration with the western European market and it would also allow LNG to be both a form of security during in case of disruptions and a form of leverage against the non-market-based pricing of Russian gas.

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The sustainability of economic growth in agriculture of Russia as a result of incompleteness of institutional changes

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Abstract
The article posed the problem of determining the value of the formal rules change, shaping the institutional environment as a whole. Its impact on sustainable economic development in the agricultural sector of the Russian economy in the period from 50th to 90th. XX century. Identified institutions, reducing the volatility of market conditions on the agricultural markets: the policy of creating buffer stocks; State support of prices, aimed at eliminating the seasonal volatility; the program of compensation payments, leveling profitability of production by region.

Keywords: *Agriculture, balance, institutions, market conditions*

JEL Classification: *E32, O13, O43*

1. Introduction

Economic growth in agriculture can be considered as a means of improving food security, social well-being of citizens and the competitiveness of domestic production. The functioning of the economy is characterized by a significant role of institutional factors in the way of economic development. In this connection **there is a need to examine institutions as factors of economic growth**.

The main factors of economic growth are considered in two basic models - the Keynesian and classical. In agriculture for economic growth understand multifaceted category that includes: economic sustainability, expanded reproduction resources, innovation development, improving the environment, sustainable development of rural areas (Gordeev, 2009, p. 15; Ushachev, 2009, p. 12). Developed is the understanding of the impact on economic growth of institutional factors (Hamilton, 1932; Porokhovsky, 2010; Shastiko, 1998). However, so far little examined the impact of the institutional environment on the growth of agriculture in Russia.

Before us is the following **objectives** - to define the role and importance of the institutional aspects that form the institutional environment in general and its impact on sustainable economic development; consideration of the specifics of Russian agricultural sector in historical perspective; describe the institutional mechanisms that stabilize prices and incomes in agriculture.

2. Data and Methods

The essence of the institutional approach to the economy, is that the wealth of nations, businesses, individual citizens depends not only on the resources available to the subject, but on the rules by which it can use these resources (North, 1997, p. 44). Typically, for a long time in the state-dominated institutions of the same type of economy (planned or market). Institutes of the different type of economy play a supporting role and act as a complementary, enabling institutional environment sustainability. In the surrounding economy, it takes on a variety of forms of economic integration: the stock exchange and government regulation of private

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joint-stock companies and state-owned enterprises, private farms and cooperatives, etc. That is, the interaction of institutions of market and planned economy.

Effective interaction of dominant and complementary institutions is achieved, according to the Russian economist Kirdina S.G., subject to the following rules:

1. Mandatory presence in the institutional environment of dominant and complementary institutions.

2. Save for each group of institutions, their roles - should remain dominant dominant and complementary - complementary.

3. Providing the necessary combination between institutions (Kirdina, 2014, p. 131-134).

Balance of institutions is a major obstacle to sustainable agriculture. Thus, in countries with a high quality of institutions and high-quality economic policy economic growth amounted to 2.4%; in countries with high institutional quality and low quality of economic policy - 1.8%; in low quality of institutions and high quality of economic policy - 0.9%; in low quality of both factors - 0.4% (Tambovtsev, 2009 p. 11). A study of sustainability of agricultural production must also take into account the long-term cyclical fluctuations in the agri-food market (Gaysin, 2014, p. 13). When writing the work was used educational and scientific literature. Statistical information for writing the work was taken from public databases of the Russian Federation and the declassified data CSM RSFSR territorial body of data the Federal State Statistics Service. The methodological basis for writing the work was easy chair of political economy RSAU-MTAA and Lomonosov Moscow State University. In the preparation of the information, its processing have been used various methods of investigation of economic phenomena: historical, logic, calculation and constructive, Economics and Statistics, and others.

3. Results and Discussion

3.1 Institutional changes in historical perspective (the second half of XX - beginning of XXI centuries)

In Soviet Russia the institutional design was not directed at the fundamental changes in the specification of property rights and transaction costs levels, but mainly on the institutional changes such as the introduction of new rules of management, new forms and methods of public administration sector, the improvement of public support mechanisms for agricultural enterprises.

Table 1: The main indicators of economic development of agriculture in Russia (1950-2014 gg.)
(Statistical compilations "RSFSR National Economy", 1956-1990)

Indicators*	Units	51-55	56-60	61-65	66-70	71-75	76-80	81-85	86-90	91-99	00-14
Gross agricultural output at constant prices in 2014	billion rubles	1886	2645	2960	3588	3897	4040	4204	4702	3341	3494
Productivity in agriculture	thous. rub./slave	100	170	226	292	340	364	379	449	336	496
Gross agricultural output per 1 hectare of sown area	thous. rub./ha	19	23	23	29	31	32	35	39	32	45
Gross agricultural output per capita	thous. rub./person	18	23	24	28	29	30	30	32	22	24

*on average per year

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Down to the middle ***of 50-ies of the XX century****, the institutional environment of agriculture* can be described as a system with the basic institutions of a planned economy, resulting from complete failure of the complementary institutions of a market economy. Institutions agricultural production planning and binding supplies helped farmers to adapt to the extreme conditions of wartime. But in peacetime, such institutional environment leads to a lack of economic independence, opportunistic behavior, weak material interest of the collective farmers in the results of their labor.

In the early 50-ies of XX century agriculture Soviet Russia was characterized by extremely difficult situation. The turning point that led to institutional changes in the existing agricultural structure became Plenum 1953 changes were made all the institutions of the agrarian sector: Property Institute, Institute of obligatory deliveries to the state of production, the Institute co-operative labor, Planning Institute.

Changes in this period were directed primarily at the observance of the institutional balance of conditions, ie, for the dynamic development in a planned agriculture tried to develop complementary institutions of a market economy (financial stimulation of workers, the development of commodity-money relations, indicative planning). On the other hand, the process of state-owned farms institute gain operation (state farms), to the detriment of the collective and individual farms.

Changes in the institutional environment, agriculture, pledged **in 1953 and continued in 1954-1958** contributed to *strong economic growth in agriculture* (average growth rate of gross output of 7.5% per year). However, the resistance of the bureaucracy, dogmatism of some leaders, errors in management and planning of agricultural production has led *to the decay of this growth* (**1959-1963 years**).

The deterioration in economic performance and increased costs have led to an understanding of the need for transformation of the existing institutional framework of agriculture.

In the years **1964-1970** to implement the proactive design of formal institutions, aimed at the gradual change in the institutional environment of agriculture. There has been an increase in purchase prices, decline in state procurements; a significant increase in investment in agriculture; land reclamation; mechanization machines.

We decide to continue the policy that was carried out in the early 50-ies of XX century. Turn on this path proved beneficial farming has *grown steadily* (5.3% annually).

Further development of agriculture (**1971-1981** years) was associated with decreased return on investment of material resources. Accepted by the concentration of production measures led to an ever greater nationalization of production. All tactical actions taken (by the development of agriculture chernozem zone of RSFSR, the strengthening of inter-farm cooperation, the material and technical base) *further pushed the entire system of agricultural production away from the revival of the complementary institutions of a market system*. Formed institutional environment agriculture constrained progressive development of society and *slowly began to stagnate* (-0.25% annually).

Country in the years 1971-1981 *has lost chance for the formation of the institutional environment of agriculture*, on the transformation of the socialist planned economy to a mixed system.

Trying to reform the agriculture undertaken in the **1982-1990** biennium. when it adopted the "Food Program of the USSR for the period till 1990". Ongoing institutional changes have allowed for the first time to *ensure high rates of economic growth in agriculture* (1982-1983

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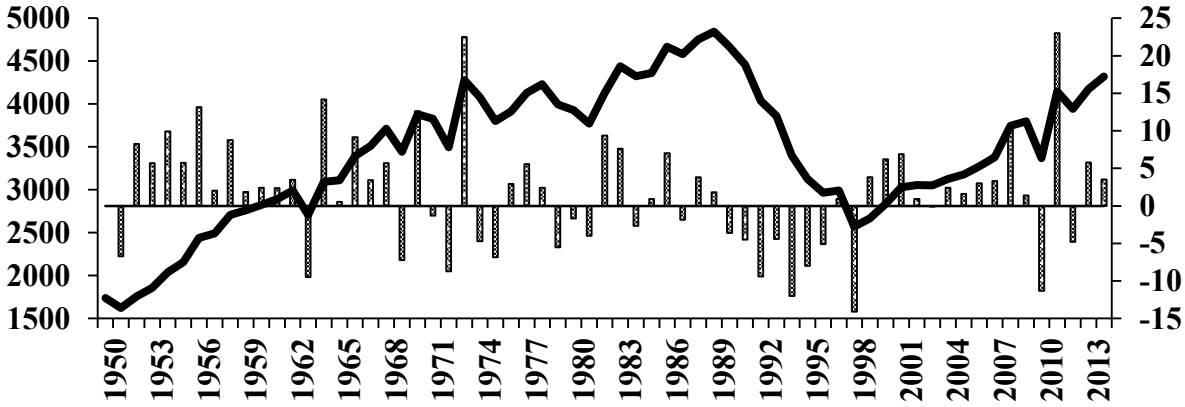
years of 8.5% per year). However, further development of agriculture (**1984-1990** years) Characterized by the *instability of economic growth*.

Figure 1 – Economic development of Russian agriculture in the years 1950-2014 (left scale / EP Agriculture / - billion rubles in comparable prices of 2014, right scale / chain growth rates / - %)



(Statistical compilations "RSFSR National Economy", 1956-1990)

The fundamental factor that contributes to a drop in growth of the agricultural sector, can be regarded as imperfect institutional environment, which is reflected in the shortcomings of the planned economy system. *There was an increase in transaction costs in agriculture*:

- At the management level of enterprises lacked incentives to the introduction of scientific and technological progress (transaction costs of identifying alternatives).

- Employees of farms had little interest in the results of their work (transaction costs of opportunistic behavior).

- Rigid system of public prices and tariffs led to a faster growth of costs with respect to increments of gross production (transaction costs of negotiating).

- Extra-large collective and state farms are generally worked efficiently (Lipnitsky, 2014, p. 27-28) (transaction monitoring costs).

In the 80 years I had the opportunity to radically change the situation in the agricultural sector. But because of the imperfection of the whole institutional environment that did not happen agriculture. *The main mistake in the construction of the institutional environment of agriculture Soviet Russia was non-optimal ratio of base (scheduled) and complementary (market) institutions.* Totally dominated institutions of the planned economy - Institute of socialist property, the institution of compulsory deliveries to the state, the institution of the cooperative work, Institute of production planning. It blocks the natural development of the institutions of a market system. Such an institutional system would not be viable without deep reforms, which resulted in a deep systemic crisis in the 90-ies of XX century.

Central planning of the agricultural markets need to replace its system of market regulation. Institutional environment demanded the release of the monopoly of large farms and the formation of diverse forms of ownership and organization of production. However, it so happened that instead of evolutionary institutional reforms of the agricultural market has been carried out "shock" revolutionary transition that does not contribute to the success of the reforms (**1991-1998** years). Reforms of the 90s represented a fundamental reform of agriculture in Russia and included: agro reforms, land reforms, reforming the state management of agriculture system. Ill-conceived macroeconomic policy of the Russian state in the 90s *dealt a serious blow to agriculture* (45% drop by 1998).

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Institutional reforms after the default of 1998 should be divided into two stages. The first phase (**1999-2005**) can be characterized as a period of unsustainable growth of agriculture with minimal government support. subsidizing of interest rates on short-term loans in the amount of 2/3 of the Central Bank rate: During this period, some of the tools in support of agricultural producers have been taken introduction of the single agricultural tax; Russian Agricultural Bank education; adoption of the program of financial recovery of enterprises. At the same time, to ensure qualitative changes in the agricultural sector, these measures were not enough.

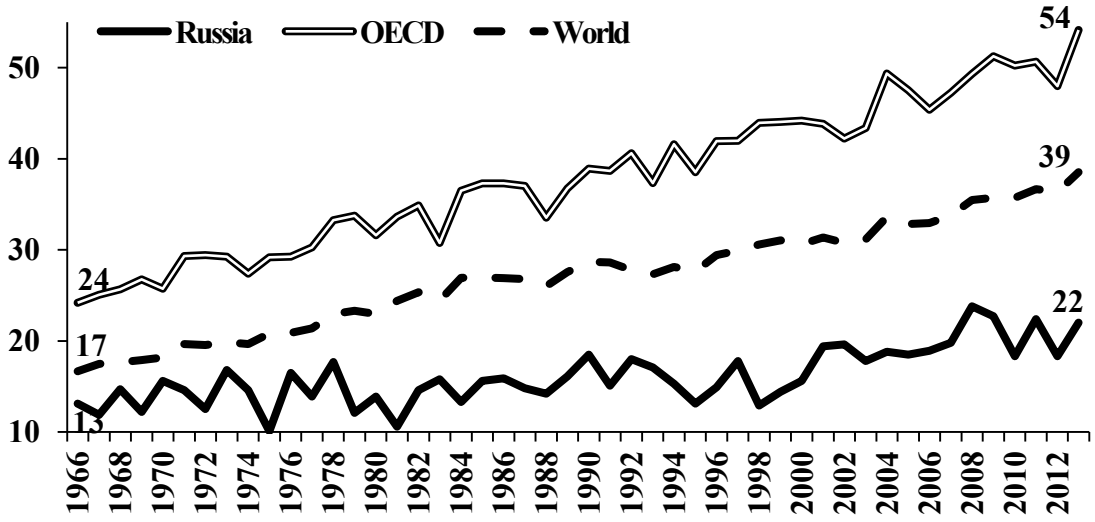
The second phase **starts in 2006**. This period is characterized by strengthening the institutional design of the state of the agricultural market. Accepted targeted development program, a national project, the state program of development. In general, the implementation of government measures to agribusiness development was positive: for 9 years, agricultural growth was 32%.

The main mistake in the construction of the institutional environment of agriculture of modern Russia in the 90 years it has been less than optimal ratio of base (market) and complementary (planned) institutions. Complete rejection of the existing institutional system and the transition to the market without taking into account the effect of complementary institutions led to a disastrous drop in production. Only after the beginning of the institutional design of formal institutions in agriculture began a steady economic growth in this sector.

3.2 Institutional mechanisms for the stabilization of prices and incomes in agriculture

In modern Russia, **two groups of factors causing unstable price dynamics in Russian agriculture**. *The first group of factors* of price volatility associated with unstable dynamics of the growth of the gross output of the industry, which, in turn, is due to its high shaken in the plant, with high volatility from year to year in crop yields (Fig. 2). Unstable yields in Russia is due, along with the influence of climatic factors, and factors such as the lack of investment in modern agricultural technology in breeding, seed production, land reclamation, etc.

Figure 2 – Yields of crops, kg/ha



(Statistical compilations "RSFSR National Economy", 1956-1990; Statistical data Unified interdepartmental statistical information system (1991-2014))

Along with fluctuations in yield volatility in prices affected by *factors related to changes in the agricultural market situation, food*. These factors, for example, may be an increase in foreign economic demand for domestic grain, causing export growth or change in sentence structure.

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The action of institutions and institutional arrangements for sustainable economic growth is mainly in two directions. The first direction includes **institutes of innovative development of agriculture**, to ensure the stability of the dynamics of crop yields mitigating the impact of climate instability on productivity (Golubev, 2013, p. 61-77). It institutes aimed at the introduction of advanced agricultural technologies, produces a more valuable in economic and biologically intensive varieties on a large-scale land reclamation and others.

The priority model of institutional interaction of enterprise structures of the agricultural sector are *clusters*, understood as the organizational and economic type of innovations in agriculture. The interactions in these systems can be represented by two models: 1) forming a cluster around a large subject, in fact the core of the cluster, which gathers the smaller entities; 2) association of independent, equal in scale enterprises to support each other, which increases the stability of their growth. The advantage of such networks in agriculture is their high cost-effectiveness due to low transaction costs.

A separate issue is the distribution system innovation in the agricultural sector. Successful international experience suggests that the new institutions and their corresponding formal rules often formed by the practice of private initiative. Transfer to replicate innovations in agriculture through a variety of mechanisms. However, recent studies have shown that despite the rapid growth in the world of new development institutions in the industry, in agriculture with all such tasks copes *system of agricultural counseling* (Kozlov, 2014, p. 82-83).

The institutional environment may have an impact on the sustainability of economic growth in agriculture - **impact on the state of the market** to mitigate the volatility of prices and incomes in agriculture for years, seasonal, in the territories. This impact is on the main elements of the agro-food market situation - the demand and supply for the purpose of changes in market prices.

As the formation and development of the agricultural market, the transition to a phase of saturation it is possible to increase in the amplitude of the short-term price and income fluctuations in the food market. To reduce or eliminate the amplitude of short-term fluctuations abroad and in Russian *policy is used stabilizing pricing environment* (policy of creating a "buffer" stocks).

Institutional mechanism for the stabilization of situation is mainly used in the grain market. The market mechanism is not able to stabilize the proposal to the grain market at the level of demand at a competitive cost effective balance, and therefore not able to provide both price and income stability of producers over the years.

The mentioned leads to the conclusion that in order to stabilize prices and incomes of grain producers is objectively necessary state intervention in the processes of formation and functioning of the grain market by making use of leverage, regulate supply and demand. In a good year the demand from the population and enterprises of grain is less than its supply. Due to the excess grain market prices fall. State in this situation, the following measures can be taken to save on the annual average price level:

1. Reduction of supply of grain in the domestic market due to increased government spending on promotion of grain to the world markets, for the construction of port terminals, etc. This path is not always possible, because it depends on the world grain market conditions and many other factors.

2. Increased demand for grain by the state purchasing interventions on the grain market. At the operational implementation of the measures, with adequate allocation of budgetary funds for the purchase of grain the total demand for grain will increase the market prices rise. Since

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2001, the Russian government is using a policy of purchasing interventions to stabilize the grain market.

In the developed countries for decades in the twentieth century, actively used such *institutional mechanism as state support for agricultural prices* (Gaysin, 2014, p. 58-60, 73-76), in order to eliminate their seasonal volatility and, accordingly, the oscillation of income, for example, in the grain market. One of the most common forms of this institute price and income support programs were government loans of bottom (of the program supported by the price).

The mechanism of action of this institution is as follows:

- Issue in the fall after harvest producers received loan secured products at preferential interest;

- Calculation of a credit on the collateral rate (for supporting the price, usually at the level of the market price or slightly above it);

- Repayment of the loan in the spring: the products on the collateral rate or amount of money from the sale of products.

Widely used in world practice institutional mechanisms to mitigate fluctuations in prices and incomes, leveling the yield of production by region and climatic zones.

A promising institutional mechanism aimed at addressing the lack of financial credit resources are *agricultural receipts*. This experience tested in Brazil and the Ukraine. Agricultural receipt - a document of title, retaining the unconditional obligation to the farmer of the debtor, secured by the pledge, to supply agricultural products or to pay money to certain conditions in it. The introduction of this financial mechanism is intended for financing of small and medium-sized businesses, as their access to credit resources of commercial banks is limited, despite the partial compensation of bank interest by the state. Agriculture released not only allow farmers to raise the necessary resources for crop production, but also protect the interests of the creditor.

4. Conclusion

1. The main mistake in the construction of the institutional environment of agriculture Soviet Russia was non-optimal ratio of base (scheduled) and complementary (market) institutions, which led to the instability of the economic growth of agriculture.

2. The main mistake in the construction of the institutional environment of agriculture of modern Russia in the 90 years it has been less than optimal ratio of base (market) and complementary (planned) institutions. Complete rejection of the existing institutional system and the transition to the market without taking into account the effect of complementary institutions led to a disastrous drop in production.

3. Based on the analysis of the agricultural market dynamics isolated institutions, promote economic growth: innovation development institutes and institutions that affect the state of the market.

4. Disclosure of the institutions, reducing the volatility of the situation on the markets of agricultural crops: the policy of creating buffer stocks; State support prices, aimed at eliminating the seasonal volatility; program of compensatory payments; alignment of profitability by region of production.

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Economic weights as a tool for sustainable livestock farming

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Abstract
The livestock farming synthesizes many aspects which should be taken into account when economic weights are calculated. The most common approach to calculate the economic weights is a bio-economic modelling of the production system. Economically important traits are defined thought the modelling of herd structure using the Markov processes and iterative procedure, taking the total profit as the criterion of the economic efficiency. Marginal economic weights are expressed as a numerical approximation of the partial derivation of the profit function. These are standardized through genetic standard deviations and then expressed relative to the certain trait or as a proportion on the sum all of traits. Except of the production traits, the functional traits (health, reproduction, survival) and feed efficiency traits are very important for the sustainable and competitive animal production. Next to the economic also the environmental benefit (reduction of emissions through more effective utilisation of feed), ensuring the animal welfare (lower mastitis and claw diseases incidence) and finally the food security and sustainable development of the domestic agriculture should be mentioned.To calculate economic weights, the program package ECOWEIGHT (for cattle and for sheep) can be usefully applied. At present, the modulefor pigs as a part of the program package is under development.

Key words: *animal production, economic weights, efficiency, sustainability*

JEL classification: *Q01, Q12, Q13*

1. Introduction

Economic success of agricultural sector is in generally determined by environmental and climatic conditions, marketing strategy, production variables, human labour participation and effective utilisation of inputs (Daňo et al., 2001, Wolfová et al., 2007, Látečková et al., 2009, Krupová et al,. 2012). However, animal production is an important part of the agriculture sector in each country (Wolfová et al., 2007, Krupa et al., 2005, Doucha et al., 2012). Farmers should take into account the complexity of the animal production operation and understand how individual components interact to ultimately affect farm profit (Daňo et al., 2001). To develop strategies that increase economic sustainability for farms, it is important to identify which variables influence the system and how they affect the profit. From the breeding point of view, in economically oriented companies, the aim is to improve the biological potential of animals which is a function of additive genetic values of traits weighted with economic values. A beneficial solution is to use a production function where the weights are obtained by calculating the partial derivative with respect to the trait considered, keeping all other traits constant at the mean value (Wolfová et al., 2005).

Based upon literature review, many articles are devoted to analyse of economic important traits in animal production (e. g. Koots& Gibson, 1998, Krupová et al., 2016,Wolfová et al., 2005). The objective of this short review is to comprehensively define the main principles and the most important biological specifics when calculating the economic weights and to define their impact on the economics of farms. Considering the character of study, the structure of paperis adjusted to this aim.

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2. Methods for calculation economic weights

Methods used for calculation of economic weights can be divided into subjective and objective. With the subjective methods, the economic weights of traits are calculated by setting the required genetic gain for each trait – called as desired gain method (Simm et al., 1987) or defined by a subjective decision of the breeders–called „ad hoc approach"(Groen et al., 1989).

In the objective methods,one or more equation are used to represents the behaviour of a production system. The system is modelled by positive (data evaluation) and normative approach (data simulation). The positive approach includes regression analysis that establishes the relationship between the profit of the system and the breeding values of animals for the evaluated traits. A disadvantage is that the huge amount of data from the evaluated production system is required. In addition, economic weights in this case are calculated on the basis of the level of the traits and prices achieved in the past and breeding should be oriented on the future. For this reason, the normative approach is preferred (e. g. Miesenberger, 1999, Wolfová et al., 2005).

Profit functions and bio-economic models are used in normative methods. A profit function is an equation to represent the relationship between the performance of animals in economically important traits and farm-level profit, or some othermeasure of economic outcome (Wolf et al., 2013). Economic weights are calculated as the partial derivative of the profit function with respect to each trait considered in the breeding objective. The economic weight represents the change in profit caused by a change in the phenotypic or genetic value of the given trait. Major advantage of the profit function is simplicity and facility of the results interpretation (Dekkers et al., 2004).

Bio-economic models consist of the system of equations that characterize biological and economical parameters and their relationships with the evaluated production system (Dekkers et al., 2004). Bio economic models can be based on linear (Fisher, 2001) and dynamic programming (Veerkamp et al., 1995) and on the deterministic or stochastic simulation. In a deterministic approach, the mean values of the input parameters are applied (Brascamp, 1978). In stochastic models the performance of animals is described by their mean and variability (Jones et al., 2004).

At present, a great number of authors prefer a combination of stochastic and deterministic approaches (e. g. Fuerst-Waltl&Baumung, 2009, Wolf et al., 2013). The bio-economic model of the program package ECOWEIGHT (Wolf et al., 2013) is often used to calculatethe economic values of traits. The model includes both deterministic and stochastic components. Performance of most traits is simulated as the population average, but variation in several traits is taken into account as well (Wolfová et al., 2007).

3. Methodology

The program package ECOWEIGHT (Wolf et al., 2013), at the current stage (version 6.0.4), enable to calculate the economic values for economically important traits in cattle and in sheep (Table 1) and the module for pigs is nowadays under development.

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Table 1:Structure of the program package ECOWEIGHT 6.0.4

Program	Species
EWBC	Beef cattle
EWDC	Dairy cattle
EWSH1	Sheep, one lambing per year, stand-alone program
EWSH2	Sheep, one lambing per year, used in combination with GFSH
GFSH	Sheep, program for gene flow, used in combination with EWSH

Source: Wolf et al. 2013

Considering the current unstable economic situation in animal production (mainly due to the abolition of the quota system in milk production) the program ECOWEIGHT can be very flexible and a useful tool. Variable production systems with and without production limitation can be modelled. Besides this, the program is useful for economic analyses ofvarious production systems (e. g. Krupa et al., 2005, Wolf et al., 2013). Using the bio-economic models, the impact of production, management and economic circumstances on the economic efficiency of the given production system (measured as profit) can be studied (Koots& Gibson, 1998, Krupa et al., 2005).

In the program package ECOWEIGHT, the stationary state of the herd structure is derived using the Markov chain procedure (Reinsch&Dempfle, 1998). The herd dynamics is described in terms of the individualanimal categories and probabilities of the transition between them.Profit (i. e. the difference between the present values of revenues and costs per cow and year at the stationary state of herd structure) is the criterion of economic efficiency for the modelled production system (Wolf et al., 2013):

$$profit = rev' \times NDE^{(rev)} - \cos t' \times NDE^{(\cos t)} \qquad (1)$$

where:$\boldsymbol{rev'}$and$\boldsymbol{cost'}$are the row vectors of revenues and costs, respectively, per animal, the elements of which are rev_i and $cost_i$, with i being the category of animals.$\boldsymbol{NDE^{(rev)}}$ and$\boldsymbol{NDE^{(cost)}}$ are the column vectors of the number of discounted expressions connected with revenues and costs, respectively, the element of which are $NDE_i^{(rev)}$and $NDE_i^{(cost)}$. Using this approach, all revenues and costs occurring in the herd during a year and in the life of progeny born in the herdare discounted to the date of birth of progeny. The life of progeny covered the time from birth to slaughter, death and sale or (by cows) the first calving of heifers.

Revenues in all systems are calculated for each category of animal. These revenues came from selling of all categories of animal, from selling of products typical for the given production system (e. g. milk in dairy cattle) and from governmental subsidies (direct and indirect) (Wolfová et al., 2005, Hietala et al., 2014, Krupová et al., 2016).

As stated in Wolf et al. (2013), costs are calculated separately for feeding, housing, breeding and health. All other costs (labour, interest rate for capital, energy, repairs, insurance and overheads) are accounted as fixed cost per animal category per day (e. g. Hietala et al., 2014, Krupová et al., 2016). Feeding costs are calculated on the basis of daily net energy and protein requirements of the animal (cows, breeding heifers, animals in fattening period) and on the price for feed with given dry mater, net energy and protein contents and include cost for water as well (Fox et al., 1990; AFCR, 1993). Housing costs were those for bedding (costs for straw minus revenues for manure). Breeding costs were costs for artificial insemination and included the price for semen, labour and services per conception (Krupová et al., 2016). Health costs included veterinary costs that were expressed per animal, dystocia costs expressed per calving, and cost for removing and rendering dead animals. The dystocia cost depended on proportions of total calving in each calving score class and on veterinary and labour cost specific to those scores (Wolfová et al., 2007, Wolf et al., 2013).

Based on Wolf et al. (2013), the marginal economic value of trait *l* (ev_l) is defined as the partial derivative of the profit function as follow:

$$ev_l = \frac{\partial profit}{\partial TV_l} \Big|_{TV_l = TV_{l_{av}}} \qquad (2)$$

where:*profit* is the profit per cow and year, TV_l is the value of the given trait, and TV_{lav} is the trait mean in the population. In the calculations, the partial derivative is approximated by the difference quotient.

For a better comparison of the relative importance of different traits in the scenario considered, the marginal economic values are standardized by first multiplying them by the genetic standard deviation of each respective trait (Wolf et al., 2013):

$$evs_l = ev_l \times s_l \qquad (3)$$

where:evs_l is a standardized economic weight for trait *l*, ev_l is a marginal economic value of trait *l* and s_l is the genetic standard deviation for trait *l*.

Secondary, to compare the economic importance of different traits, the relative economic values of traits are calculated as follows (Wolfová et al., 2007; Krupová et al., 2016):

$$evr_l = 100 \times \frac{|evs_l|}{\sum_l |evs_l|} \qquad (4)$$

where: evr_l is the relative economic weight for trait *l* and evs_l is the absolute value ofstandardized economic weight for trait *l*. The same principles are used, when economic values of traits in sheep and in pigs are calculated.

4. Biological specifics

Bio-economic model of the program package ECOWEIGHT (Version 6.0.4, Wolf et al., 2013) allows applying some biologic specifics. To describe this, the module EWDC (Version 2.2.3) will be used as an example in the following text.

In dairy cattle, milk production is the most important source of revenues (Michaličková et al., 2014). Selection for milk production traits has traditionally received most emphasis in national breeding programs for dairy cattle in many countries (e. g. Hietala et al., 2014). Revenues from milk are usually a function of milk amount, fat and protein content and somatic cell count. To calculate them, the pricing system, basic price, milk yield and proportion of cows on the individual reproduction cycles, calving interval, length of the lactation period andthe modified Wood function (Fox et al. 1990) are taken into consideration in module EWDC. The somatic cell count, which is defined as the average number of somatic cells per millilitre of milk is expressed as somatic cell score (Wolfová et al., 2007, Wolf et al., 2013). The pricing system for milk usually divided in high extension among the farms and countries, as well. For example, the pricing system in the Slovak Republic is usually based on fat and protein content of milk and on the somatic cell count level of milk (Krupová et al., 2016).In the module EWDC, a great variety of pricing systems can be modelled. Moreover, the milk pricing system is the most important factor affecting the economics of farms and finally the relative weighting of traits (milk volume, fat and protein content, clinical mastitis incidence and somatic cell score) included in the breeding objective (Wolfová et al., 2007, Hietala et al., 2014). At present, due to the abolition of the EU milk quota system from 2015 it

is possible to calculate economic values of traits under the quota-free milk production conditions.

Functional traits (health, reproduction and survival traits) are usually associated with a reduction of production costs (Miglior et al., 2005, Gonzalez-Recio et al., 2014) and therefore, more attention has been recently paid to their genetic improvement. Furthermore, the noneconomic value of health traits should be taken into account, which is connected with a growing interest of consumers and sociotechnical aspects of animal production, such as animal welfare and product quality (Hietala et al., 2014). The most important health traits calculated in the program EWDC are claw diseases and clinical mastitis incidence. Claw disease incidence is defined as the number of claw disease cases per cow and year at risk in the herd averaged over all lactations. Effects of claw disease on the loss of revenue due to discarding of milk during cow illness as well as additional costs for drugs, veterinary service and labour for herdsman or veterinary time are considered when calculating the economic value for the trait (Wolf et al., 2013; Wolfová et al., 2007). Clinical mastitis incidence is defined as the number of clinical mastitis cases per cow and year at risk, i. e. number of cows having mastitis divided by the total number of cows at the given day of each lactation (Wolfová et al., 2007). Effect of the clinical mastitis incidence to the economics of farm is similar like described by claw disease incidence.

Moreover, from an environmental point of view, more efficient feed utilization in dairy cattle has been connected with a reduction in greenhouse emission through lower methane and manure outputs of animals (Hietala et al., 2014). An option for achieving a direct genetic improvement in feed efficiency is selection for residual feed intake (Hietala et al., 2014). Residual feed intake is defined as the difference between the actual daily dry matter intake and the predicted daily dry matter intake of an animal (Williams et al., 2011). When the economic weights for residual feed intake are calculated, the net energy and protein digestible in the intestine requirements for growth maintenance, milk production and pregnancy and the basis of the dry matter, net energy and protein content in the feed ration of the corresponding animal category are taken into consideration (Wolf et al., 2013, Hietala et al., 2014).

5. Conclusions

Profitability of farming has become more dependent on minimizing the cost of production.To maintain the economic sustainability, production level should be improved and inputs should be utilized more efficiently. Improving animals for so-called functional traits is one way to reduce costs. The calculation methodology presented in this review provides, a comprehensive evaluation of biological (production variables) and economical aspects of the animal production system. Moreover, collection of appropriate data and a regular accounting of cost are necessary to identify optimal utilisation of inputs and to evaluate the farm from an economic point of view. Except the production traits, the functional traits (health, reproduction, survival) and traits for effective feed intake utilization are very important forthe sustainable and competitive animal production. Effective utilisation of inputs in the production process, i. e. decreasing of the unit costs is significantly determined by these traits. Moreover, next to the economic also the environmental benefit as the reduction of greenhouse gas emissions, ensuring the animal welfare and finally the higher food security and sustainable development of the domestic agriculture should be mentioned.

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Food security in the European countries

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Abstract
Food security is defined by the World food summit of 1996 as follows: „when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life". Such definition includes several aspects, therefore it is necessary to use multidimensional view to its investigation. This concept is based on three pillars: food availability, food access and food use. This issue is hence complex sustainable development issue closely connected to health, economic, environmental and other issues. Presented paper is focused on the food security analysis in European countries. For this purpose are used data from Global food security index 2015 database by The Economist Intelligence Unit (EIU) and sponsored by DuPont about food security indicators. In the first part of the paper is analyzed recent development of the food security indicators in the European countries, then multivariate analysis is used to reduce dimension of the data. Countries were sorted into classes according their food security performance. Results suggest positive tendency in the European countries from the perspective of increasing welfare, food accessibility and its distribution. On the other side, economic development and sufficient supply of food brings another phenomenon which can significantly reduce quality of life and is connected with prevalence of obesity in most of the European states.

Key words: *food security, food security indicators, multivariate analysis, sustainable development*

JEL Classification: *N5, O13, P28, Q01, Q18, Q56*

1. Introduction

During the last few years, food security became important challenge for every country. This issue has an interdisciplinary character because there are many factors which influence global food security. In accordance to economic, social, environmental and technical development, every country has possibilities which could lead to improvement of food security indicators. The fact is, that many countries have sufficient food production but worse food allocation. Improvement of the food allocation is only one from variety of solutions which could lead to improving of food security situation.

For the purpose of measuring food security was developed many global indexes. One of the most often used is global food security index (GFSI) by the Economist Intelligence Unit (EIU). The index is a dynamic quantitative and qualitative benchmarking model, constructed from 28 unique indicators that measures drivers of food security across 109 developing and developed countries. Index considers three core pillars of food security – Affordability, Availability and Quality & Safety. This index was first time published in 2012 and from that time has been many times modified to the present form.

On the other hand, The Food and Agriculture Organization of the United Nations (FAO) uses a different set of indicators to measure various aspects of food security. Indicators allow comparisons across regions and over time. They can be divided into four dimensions of food

security - availability, access, utilization and stability. An initial set of indicators was developed in 2011.

World Health Organization explains tree pillars of food security as follows. Food availability - sufficient quantities of food available on a consistent basis. Food access - having sufficient resources to obtain appropriate foods for a nutritious diet. Food use - appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation. There also exist some critics, who argues that trade liberalization may reduce a country's food security by reducing agricultural employment.

CIRAD, the French agricultural research and international cooperation organization defines four basic pillar of food security – Access, Availability, Food quality and Stability. According to research of this institution, is important to apply three main principles. First is increasing agricultural production, second is improving competitiveness of farm production and incomes of farmers and other agro-food sector actors and third is improving food safety as well as food quality, and by adding value to traditional local products.

Both database obtained from EIU and FAOSTAT use wide range of indicators and includes data from various sources as World Bank, International Labor Organization, and National Statistical Offices´ publications, WHO, FAOSTAT and many others with regards to objects of interest. The set of chosen indicators is extended with background variables including economic development, welfare, lifestyle and social phenomenon strongly linked with measuring and improving food security.

Various ways of analyzing and measuring food security lead to different views of global food security and different attitudes to solve global food security problems. Michiel van Dijk et al. (2016) used scenario analysis to investigate food security. They present four scenarios to explore global food security up to 2050. They described process, storylines and drivers designed for food security modelling. The six key long-run drivers are population growth, GDP per capita, cereal yield, nominal rate of assistance, meat consumption and land use. Key drivers used in scenarios analysis are also used in a set of indicators in the Global Food Security Index.

Another team of authors (Qureshi, Dixon and Wood 2015) analyzed different types of public policies which can influence food security situation at country's level. They conclude that the effectiveness of food security policies is determined by selecting the best bundle of policy instruments for the specific context and country and that tradeoffs between policy instruments should be well-understood, in order to achieve the right goals and avoid perverse outcomes.

On the other hand, Firel and Ford (2015) argue, that food security is not just a food policy issue. These influences operate both directly through the food system and indirectly through political, economic, social, and cultural pathways - peoples' dietary behaviors are a response to the broader daily living conditions in which they are born, live, learn, work and age. They propose that to address food insecurity and diet-related death and disease, policy must tackle the systemic problems that generate poor nutrition in all its forms, and reflect how our food systems are making people sick. This has implications for economic, agriculture, food, social and health policy at the global, regional, national and local levels.

Godfray, Beddington, Crude et. Al. (2010) claim, that growing competition for land, water, and energy, in addition to the overexploitation of fisheries, will affect ability to produce food, as will the urgent requirement to reduce the impact of the food system on the environment. The effects of climate change are a further threat. But the world can produce more food and can ensure that it is used more efficiently and equitably. They emphasize, that multifaceted

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and linked global strategy is needed to ensure sustainable and equitable food security, different components of which are explored here.

The main objective of the presented paper is the analysis of current food security situation in selected European countries. This objective is accomplished by comparing countries with regard to analyzed indicators in the first part. In the second part are investigated countries clustered into different groups according analyzed indicators. Finally, created groups are compared and most different factors are identified. In the conclusion are identified the most and least positioned countries according their performance in food security indicators.

2. Data and methodology

Source of the data was Global food security index 2015 database by The Economist Intelligence Unit (EIU) and sponsored by DuPont. Variables were selected according to pillars of food security (affordability or access, availability and food quality and stability which some sources define as a use of food) and include also background variables which can influence food security situation. With regards of analyzing a set of developed European countries from the total number of 36 indicators were selected variables which can be considered as important factors in Europe and represent individual pillars of food security. Following variables across 26 European countries (this was influenced by the availability of data) countries for the period of year 2015 were selected:

Pillar 1: Affordability

Indicators	*Formula*	*Description*
Food consumption	% of household expenditure (% of total share)	household expenditure spent on food at national level
Proportion of population under global poverty line (Poverty)	% of population living under $2/day PPP (%)	prevalence of poverty
GDP per capita	US $ at PPP/capita	individual income and affordability of food

Pillar 2: Availability

Indicators	*Formula*	*Description*
Average food supply	kcal/capita/day	amount of food available for human consumption per capita
Public expenditure on agricultural R&D	rating 1-9 (9=best, 1=worst)	government spending on agricultural research and development[1]
Volatility of agricultural production	standard deviation	standard deviations of the growth in agricultural production over the most recent twenty years period for which data are available
Corruption	rating 0-4 (4=highest risk)	pervasiveness of corruption in country by assessing the risk of corruption[2]
Food loss	total waste/total domestic supply quantity (tonnes)	post-harvest and pre-consumer food loss as a ratio of the total domestic supply of crops, livestock and fish commodities

[1]expenditure on agricultural R&D is a proxy for agricultural innovation and technology that increases market efficiency and access.

[2]corruption can impact availability through distortions and inefficiencies in the use of natural resources, as well as bottleneck inefficiencies in food distribution.

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Pillar 3: Quality and Safety

Indicators	*Formula*	*Description*
Diet diversification	% of non-starchy foods (%)	the share of non-starchy foods (all but cereals, roots, and tubers) in total dietary energy consumption

Background variables

Indicators	*Formula*	*Description*
Human Development Index (HDI)	rating 0-1	a composite index that measures development by combining indicators on life expectancy, educational attainment and income
Global Gender Gap Index (GGGI)	rating 0-1	gender equality: the relative gaps between women and men, across a large set of countries and across the four key areas of health, education, economy and politics
EIU Democracy Index	rating 1-10	state of democracy[3]
Prevalence of Obesity	% of obese population	obese population over 20 years of age[4]

[3]index includes indicators in the following 5 categories: Electoral process and pluralism, functioning of government, Political participation, Political culture and Civil liberties in 165 states and 2 territories

[4]obesity is defined as having an age-standardized body mass index (BMI) greater than 30 %

In the first part of presented research results were applied descriptive statistics to present current situation across investigated countries. Then a multivariate analysis of principal components was applied to reduce dimension of the data and remove collinearity among variables. Results of this analysis were four standardized principal components which were obtained as the linear combination of the original variables. The main objective was fulfilled by classification of analyzed countries into clusters which represents similarity in relation to food security indicators.

3. Results and discussion

Situation in the Europe is first characterized by descriptive statistics of indicators which can significantly influence food security situation. Indicators are ordered according to pillars. At the end of this part are described background variables which are not included in the pillars but they are closely connected with the food security. Summary of the descriptive statistics is in the Table 1.

Table 1: Descriptive statistics of the selected food security indicators

Indicator	Mean	St. Dev	Min	Max	Range	Median	Coeff of variation
Food consumption	18.13	10.02	9.16	49.40	40.24	14.12	55.28
Poverty	0.46	1.01	0.00	3.92	3.92	0.00	218.69
GDP per capita	34131.54	14208.83	8400.00	68040.00	59640.00	34405.00	41.63
Average food supply	3341.08	267.21	2724.00	3793.00	1069.00	3388.50	8.00
Public expenditure on agricultural R&D	2.96	2.07	1.00	8.00	7.00	2.50	69.76

Volatility of agric. prod.	0.14	0.08	0.06	0.37	0.31	0.13	55.99
Corruption	1.62	1.15	0.00	4.00	4.00	1.50	70.95
Food loss	2.86	2.01	0.40	9.17	8.77	2.28	70.42
Diet diversification	66.81	6.25	53.00	76.00	23.00	68.50	9.35
HDI	0.85	0.06	0.73	0.94	0.21	0.87	6.68
GGGI	0.74	0.05	0.62	0.85	0.23	0.73	7.37
EIU Democracy Index	7.74	1.41	3.69	9.93	6.24	7.94	18.17
Prevalence of Obesity	20.92	3.88	14.90	29.30	14.40	20.70	18.55

Source: author´s work based on database by The Economist

In the food consumption could be expected higher values in case of less developed countries with lower income level, and low values in developed countries with high income. Average share of food consumption was 18.13% with the standard deviation 10.02%. Almost half of the analyzed countries exceeded 14.12% share of the food consumption. Minimum value was in the United Kingdom (9.16%) and Switzerland (9.26%). The highest value of food consumption was in Romania (49%) where people spend almost half of their expenditure on food. High values were also recorded in Belarus (39.2%), Ukraine (38.9%) and Serbia (27.4%). Most of the analyzed countries recorded value of food consumption share under 30%. Food consumption in Slovakia represent 17.36% which is slightly under the European mean and similar to the rest of central European countries (Czech Republic 15.4%, Poland 18.5% and Hungary 17.6%, all countries are below European mean). The difference between highest and lowest food consumption is 40.24p.p. Variability expressed by coefficient of variance was 55%, which means great differences across European countries in food consumption between European countries.

Second indicator expressed proportion of population under global poverty line. In most of the analyzed countries was value of this indicator close to 0. Significantly different values from 0 were recorded in 9 countries: Ukraine (0.03%), Poland (0.11%), Hungary (0.17%), Serbia (0.47%), Slovakia (0.49%), Romania (1.59%), Turkey (2.56%), Spain (2.67%) and Bulgaria (3.92%).

Most frequently used measure of economic development is GDP per capita. Average value of GDP per capita in the analyzed set of countries was 34131$ per capita with standard deviation 14208.83$ per capita. Half of the countries reached less GDP than 34405$ per capita. Difference between country with highest (Norway 68040$ per capita) and lowest GDP (Ukraine 8400$ per capita) is 59640$ per capita. This value suggests big differences in economic development across Europe. This is confirmed also by coefficient of variation, which means that standard deviation is almost 42% of average. Most developed country in the central European region is Czech Republic (29170$ per capita), then Slovak Republic (27640$ per capita), Hungary (24570$ per capita) and Poland (24470 $ per capita). All central European countries performed below mean value.

Another important food security indicator is the average food supply. The average value of this indicator in the European countries was 3341 kcal/capita/day with standard deviation 267.21 kcal/capita/day. More than 50% of the analyzed countries reached food supply over 3388 kcal/capita/day. Highest value of food supply was in Belgium (3793 kcal/capita/day), Austria (3784 kcal/capita/day) and Turkey (3680 kcal/capita/day). Lowest food supply was in Serbia (2742 kcal/capita/day), Bulgaria (2877 kcal/capita/day) and Slovakia (2902 kcal/capita/day). Variability expressed using coefficient of variation was 8% which mean low difference in food supply among analyzed countries. There can be concluded that all

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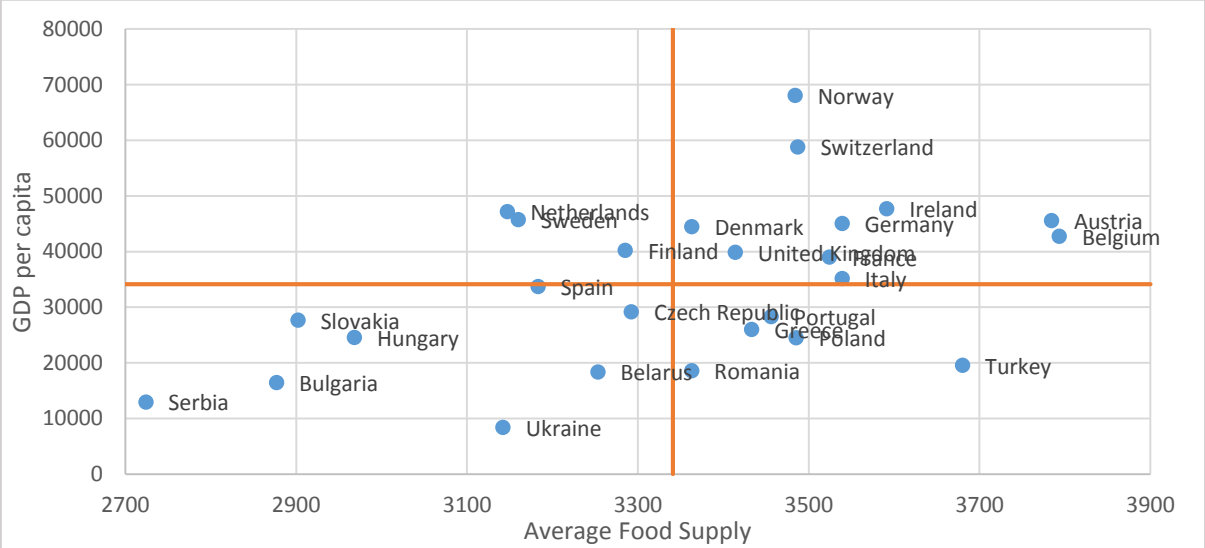
European countries are well supplied. Situation in the central European region is similar. Highest food supply in Central European region was in Poland (3485 kcal/capita/day), which is only central European country above mean value. The rest of central European countries performed under average (Czech Republic 3292 kcal/capita/day), Hungary (2968 kcal/capita/day) and Slovakia (2902 kcal/capita/day).

Relationship between average food supply and GDP is shown on the figure 1. Orange lines on the figure refers to average value of the indicators and create four quadrants. In the left bottom quadrant are countries with under average value of both indicators. In the upper right quadrant are localized countries with over average value of both indicators. The right bottom and upper left quadrant is for countries with the under average value of one indicator and over average value of the other.

Figure 1: Average food supply vs. GDP per capita



Source: author´s work based on database by The Economist

Expenditure on agricultural research and development is another indicator belonging to second pillar of food security. Average mark among evaluated countries was 2.68. Highest spending on agricultural research and development was recorded in Ireland and Netherland (both 8) which clearly over performed the rest of the Europe. Second place belong to France, Germany and Spain (5). The worst result (evaluated 1) was recorded in Norway, Greece, Denmark, Romania, Czech Republic, Belarus, Sweden, Ukraine, Hungary and Serbia. Best result in the expenditure on agricultural research and development in central European region was in Slovakia (4) and Poland (2).

Volatility of Agricultural production is another indicator in accordance with second pillar. Many countries recorded relatively low level of production volatility, which means sufficient amount of available production. Average value of volatility was 0.14, and 50% of countries performed over value 0.13. Highest volatility of production was recorded in Belgium (0.37) and Bulgaria (0.31). Lowest volatility of agricultural production was in Greece (0.059), Denmark (0.062) and Turkey (0.066). Value of this indicator is strongly influenced by climate and environmental conditions in analyzed countries. Highest volatility in central European region was in Hungary (0.25) and Slovakia (0.18) then followed Poland (0.13) and Czech Republic (0.12). This result means stable agricultural production in central European region.

Another factor which influence availability of food, especially in less developed countries, is corruption. This factor is also important for overall development of the country. Average

value of this rating in European countries was 1.62, with standard deviation 1.15. 50% of countries performed over value 1.5. Highest risk of corruption was found in Ukraine (rating 4). Then followed Bulgaria, Romania, Serbia, Italy, Turkey and Greece (rating 4). Lowest risk of corruption (rating 0) was found in Switzerland, Netherland, Sweden, Norway and Denmark. Risk of corruption in all central European countries was evaluated by rating 2.

Last indicator in the pillar 2 is food loss. Average value of this ratio in the analyzed set of countries was 2.86 with standard deviation 2.01. 50% of countries recorded food loss above 2.28. Highest food loss was in Romania (9.17) and Turkey (8.98) which clearly exceeded the rest. Then followed Greece (4.57) and Serbia (4.28). This result suggests low efficiency of food industry in these countries. On the other side, lowest food loss was in Finland (0.19) and Switzerland (0.39). The only central European country with food loss value over average is Poland (3.75). Then follows Hungary (2.74) and Slovakia (2.36). Least value of food loss in region was found in Czech Republic (1.36).

The only indicator from the pillar 3 included in presented analysis is diet diversification. Average value of this indicator was 66.81% with the standard deviation 6.25%. 50% of analyzed countries exceeded 68.5%. Highest share of non-starchy foods in total dietary consumption was in Switzerland (76%), Spain (75%), Austria (74%), Netherlands (73%) and Germany (72%). All of these are developed countries where population prefer healthy lifestyle. On the other side, the least share of non-starchy food in total dietary energy consumption was recorded in Turkey (53%), Romania (55%), Bulgaria (57%) and Ukraine (58%). Central European countries with the result over average were Hungary (70%) and Czech Republic (69%). Slovakia (65%) and Poland (59%) performed under the mean. Diet diversification is connected not only with food supply, economic development but also with eating habits in analyzed countries.

All variables described above were included in the basic three pillars of food security. In our research work we also analyzed background variables closely linked with food security – Human Development Index, Global Gender Gap Index, EIU Democracy Index and Prevalence of Obesity. Average value of HDI in the set of analyzed European countries was 0.85 with standard deviation 0.06 which means well developed countries with low variability. 50% of the countries reached level above 0.87. Most developed countries are Norway (0.94), Switzerland (0.92), Netherlands (0.92) and Germany (0.91). On the other side, least developed in the analyzed set of countries were Ukraine (0.73), Serbia (0.74) and Turkey (0.76). The only central European country which performed over average value was Czech Republic (0.86). Then followed Poland and Slovakia (both 0.83) and Hungary 0.82.

Another background variable is Global Gender Gap. This indicator is also connected to almost all sectors including agriculture. We can expect more gender equality in more developed countries. Average value was 0.74 with standard deviation 0.05. 50% of countries performed under 0.73. Highest value of this index were recorded in northern European countries Finland (0.85), Norway (0.84) and Sweden (0.82). Least gender equality was found in Turkey (0.62), Czech Republic (0.67), Hungary (0.68), Greece (0.68) and Slovakia (0.68). All central European countries performed under average, best result was in Poland (0.7). The rest of the central European countries was among the worst in the Europe.

Another variable which can indirectly affect food security (especially access to food) is the state of democracy, in this case quantified using EIU Democracy Index. Average value of this index in the set of analyzed countries was 7.74 with the standard deviation 1.41. 50% of the countries reached even higher value than 7.94. This means good status of democracy in most of the analyzed countries. Best situation is in Norway (9.9), Sweden (9.7), Denmark (9.1), Switzerland (9.1) and Finland (9.0). Most of the countries with the highest democratic score is

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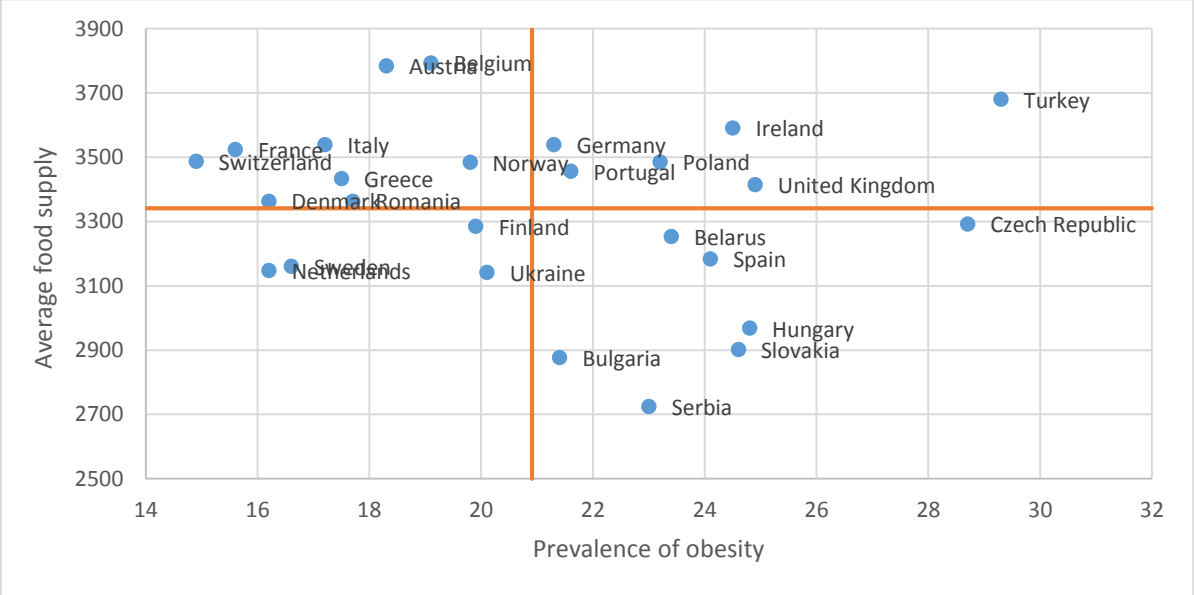
situated in the Northern Europe. Worst state of democracy was recorded in Belarus (3.6), Turkey (5.1) and Ukraine (5.4). Best result in central Europe was recorded in Czech Republic (7.94), which is actually value of median. The rest of central European countries performed under the average were Poland, Slovakia and Hungary (7.5, 7.4 and 6.9 respectively).

Last indicator used in the presented analysis was the prevalence of the obesity. This indicator can influence consumption and therefore sufficiency of the food. Indicator can be also used as the measure of the quality of diet. Average value of the indicator was 20.92% with the standard deviation 3.88%. 50% of countries recorded more than 20.7% of obese population over 20 year of age. Highest share of obese population was found in Turkey (29.3%) and Czech Republic (28.7%). On the other hand, the least share of obese population was found in Switzerland (14.9%) and France (15.6%). All central European countries scored among most obese nations. There are Slovakia, Hungary and Poland (24.6%, 24.5% and 23.2% respectively).

Figure 2: Prevalence of obesity vs. Average food supply



Source: author´s work based on database by The Economist

Relationship between prevalence of obesity and average food supply is on the figure 2. The logic of the figure is the same as was in the previous case (figure 1). There cannot be found clear relationship, but on the other side is obvious which countries are above or under average. There can be also identified countries with low prevalence of obesity despite of high food supply and on the other side, countries with high prevalence of obesity despite of high food supply.

Obesity seems to be problem in most of the developed countries. Factors which can influence this fact can be various. One of them could be possibly also diet diversification. Relationship between diet diversification and prevalence of obesity is shown on the figure 3. Between countries with higher prevalence of obesity is also Spain despite of great diet diversification.

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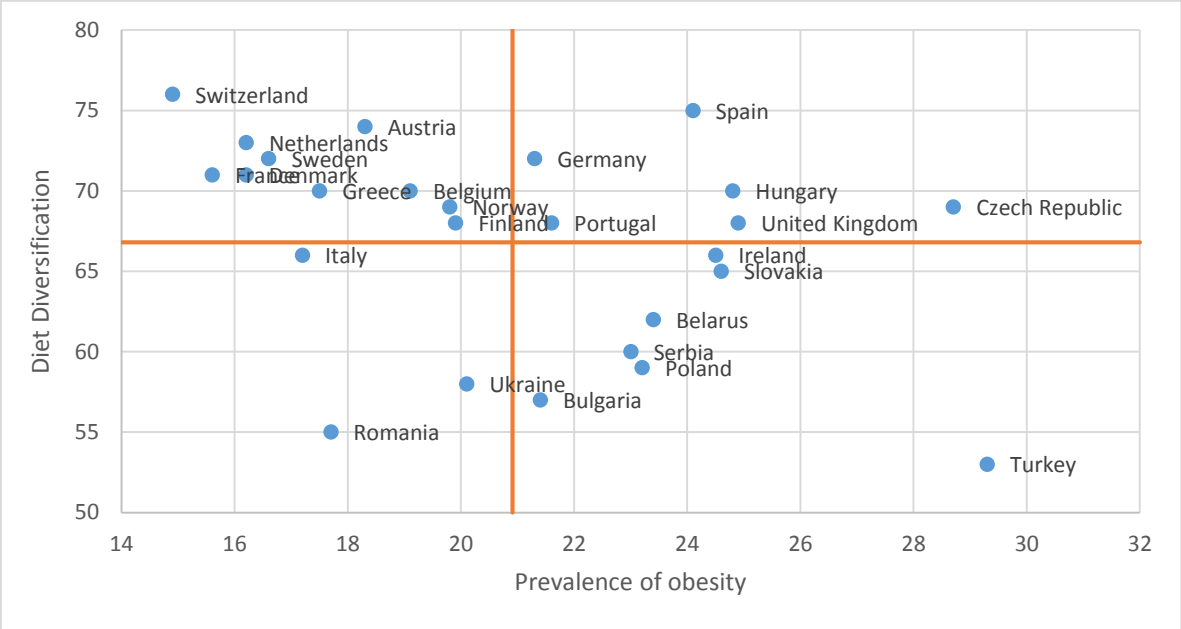
Figure 3: Prevalence of obesity vs. Diet diversification



Source: author´s work based on database by The Economist

3.1 Classification of the countries by food security indicators

We applied multivariate analysis of principal components to reduce dimension of the data and remove collinearity among variables. Result of this analysis were four standardized principal components. First component can be characterized as the Economic and development factor. Highest weights in the first component have variables: HDI, GDP, Democracy index and Diet diversification. Highest negative weight has corruption and food expenditure. Second component is connected with agriculture, because highest weights have variables expenditure on agricultural research and development, food loss and food supply. Significant role in this component plays also poverty and prevalence of obesity. Third component is closely connected with negative factors with highest weight on poverty and volatility of agricultural production. Significant role in this component play also Global Gender Gap Index. Last component is connected especially with food usage. Highest weight has Average food supply and Food expenditure. Highest negative weight in this component has Prevalence of obesity.

Estimated four components were used as the inputs into cluster analysis. This analysis was used in order to classify countries into different clusters according their performance. Countries in the same cluster should be similar in terms of analyzed indicators, on the other hand clusters should be as different as it is possible. Countries were classified into six clusters presented on the figure 4.

First cluster includes 5 countries: Austria, France, Germany, Ireland and Netherlands. All these countries can be characterized as developed countries with great quality of democracy and human development, and also low gender, no poverty, very low rate of corruption and obesity. From the point of food security view, all these countries have high food supply and high investment into agricultural research and development with great diet diversification.

Second cluster includes four countries: Greece, Poland, Portugal and Italy. All of these countries have great food supply and low rate of volatility in agricultural production. Despite of well evaluated state of democracy in these countries it is there present significant rate of corruption.

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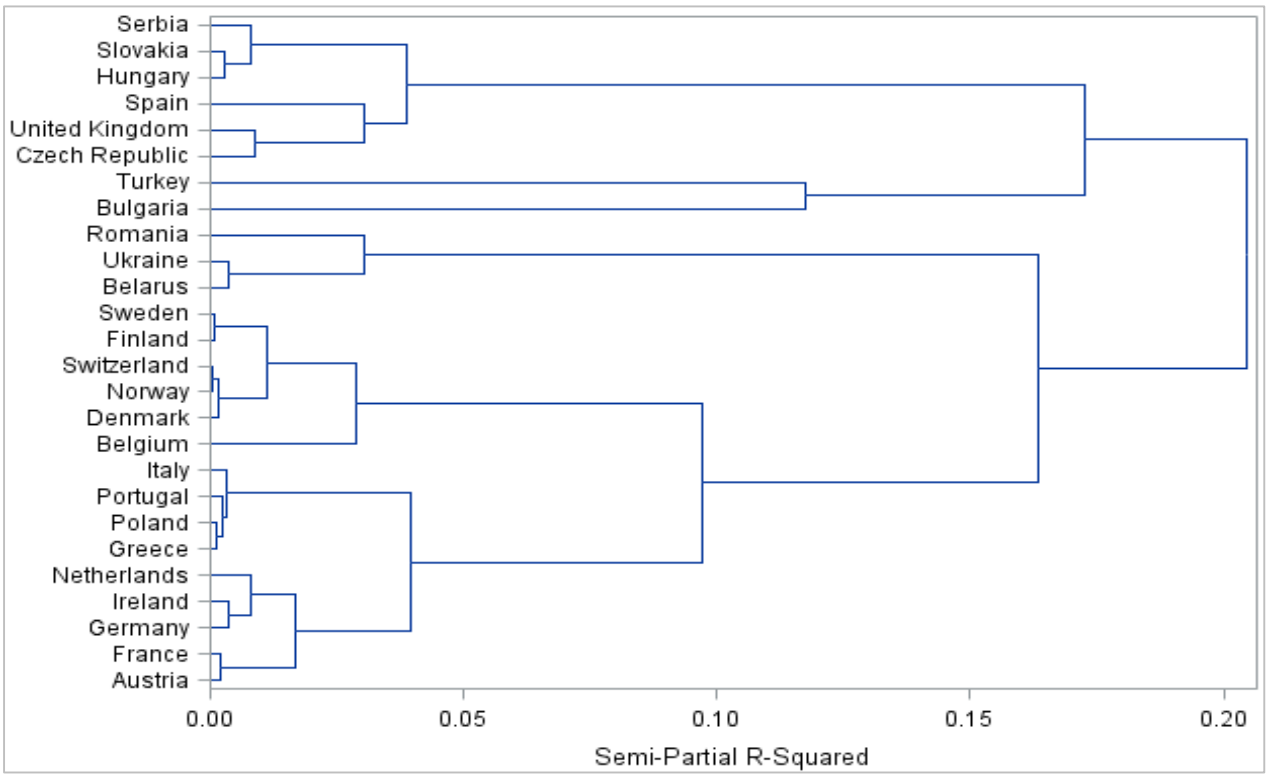
Third cluster includes countries: Sweden, Finland, Switzerland, Norway, Denmark and Belgium. All of these countries are developed countries with high value of GDP per capita and low rate of obesity and corruption. The only difference with the first cluster is in lower food supply and very low rate of food loss.

Fourth cluster includes Belarus, Ukraine and Romania. These countries recorded highest share of the food expenditure, low GDP, very low investment into agricultural research and development, low level of human development and democracy. All these countries are characterized also by the presence of poverty and very high rate of corruption and high rate of volatility of agricultural production.

Cluster number five includes only two countries: Turkey and Bulgaria. These two countries report highest rate of poverty among analyzed set of countries. There is also very high rate of corruption, great volatility of agricultural production and very high food loss. These countries can be also characterized as less developed with bad diet diversification, poor state of democracy according index and great gender gap. In spite of less development, there is evident high prevalence of obesity.

Sixth cluster includes Serbia, Slovakia, Hungary, Spain, United Kingdom and Czech Republic. In most of these countries is still present poverty. Other common characteristics of these countries includes low food supply, good diet diversification and high prevalence of obesity. Last two facts are probably reason why Great Britain was surprisingly classified into this cluster.

Figure 4: Classification of European countries by similarity in food security indicators



Source: author´s work based on database by The Economist

4. Conclusion

The main objective of the presented paper was to offer general overview of the food security situation in selected European countries and indicators which can influence it. After detailed analysis of indicators relevant for the situation in Europe can be concluded that food security situation in Europe is stable in relation to all pillars of food security, but there are still some weak spots especially in less developed countries.

Main problem which can influence especially affordability and availability of food in sufficient amount is poverty which is still present in some countries despite of relatively good situation in Europe. This is actual problem especially in Bulgaria, Spain, Turkey and Romania. This problem can be even deeper in the future when will be connected with current immigration crisis. In contrast with obesity can be concluded serious problem with allocation of food supply.

Another important problem is low efficiency of food use and huge food loss especially in Turkey and Bulgaria. High food loss problem concerns also European commission and is also mentioned in the European action plan for the Circular Economy (European Commission 2015), which suggest certain actions on this field. However, this problem is still actual in the entire Europe. Overall European mean (2,86) is according Global Food Security Index records (2012) much higher than average food loss in the United States (0,9) .

Development is connected with efficient use of available food in adequate quality, quality of food influence wellbeing and quality of life of the population. Last few years, especially in developed countries raised new problem, which is not connected with insufficient food supply, but with prevalence of obesity which decrease quality of life in many developed countries. Average prevalence of obesity in analyzed countries was 20,92%, which is accounted only for population in the age over 20. Solving of this problem is challenge and is also connected with promotion of healthy lifestyle and adequate food allocation.

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Comparative analysis of conventional and conservation agriculture

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Abstract
The goal of this paper is to analyse the comparative study of both agricultural farming: conventional and conservation agriculture as well as determine which of these technologies encourages sustainable resource management. Unsustainable use of land resources and improper agricultural management lead to the land degradation. Consequently, it negatively affect yields, for this reason, there is need to use an approach, which maximizes the production in an environmental friendly manner at the same time without increasing the production cost. The paper presents qualitative and quantitative comparisons between conventional and conservation agriculture, including statistical and economic data. Based on the comparative analysis conservation agriculture is considered as a proper management system, which meet today's agricultural challenges by demonstrating potential to secure sustained productivity and livelihoods improvements for millions of climate-dependent farmers. This technology is win-win situation, as it encourages sustainable agricultural development including itself environmental, economic and social values.

Keywords: *conventional and conservation agriculture, development, management, sustainable*

JEL Classification: *Q24*

1. Introduction

1.1 Conventional agriculture

Conventional agriculture (farming or tillage) is a set of farming practices, which commonly focus on monoculture and consist of intensive ploughing, heavy irrigation as well as using chemical inputs. Ploughing is the main operation in the conventional agriculture. It reduces weeds problem and facilitates to sow seeds. In the long term, this operation leads to land degradation such as the soil compaction, the reduction of soil organic matter and in the end to the soil erosion. Nowadays, as an alternative technology to the conventional agriculture is used the conservation agriculture, which is integrating environmental, economic and social benefits.

1.2 Conservation agriculture

Conservation agriculture (CA) is an approach to managing agro-ecosystems for improved and sustained productivity, increased profits and food security while preserving and enhancing the resource base and the environment (FAO, 2015). There is inequality between agricultural productivity and world population growth. For this reason, there is need to use an approach, which maximizes the production in an environmental friendly manner at the same time without increasing the production cost. Conservation agriculture, which is more integrated approach, is seen as being able to reduce land degradation and increased food security in a more sustainable way.

The Dust Bowl (Dirty Thirties) destroys the agriculture and environment of the USA and Canada prairies during 1930s (Buonanduci, 2009). It gives impulse to bring up the idea of implementing CA. American authors Edward Faulkner and Louise Bromfield firstly mentioned about CA in their works. Based on FAO explanation CA has main three principles:

minimum soil disturbance, permanent soil cover and crop rotation. It is a way to combine profitable agricultural production with environmental concerns and sustainability and it has been proven to work in a variety of agro-ecological zones and farming systems (FAO, 2015).

While implementing CA technology, there are other significant factors, which need keeping under a careful control such as residue, pest and weed managements. CA technology is win-win situation, as it encourages sustainable agricultural development including itself environmental, economic and social values.

1.2.1 Environmental benefits

Firstly, the main reasons that cause the loss of soil moisture are evaporation and runoff. Technically, 60%-70% rainfall is evaporated, 10%-20% loses as runoff and only 10%-20% water that filters into the soil is useful for agriculture (Li Hongwen & Li Wenying, 2012). With maintaining residue on the surface of the land, CA reduces soil erosion as well as provide higher infiltration. Secondly, CA is regarded as carbon sequestration, it has been calculated that the total potential for soil carbon sequestration by agriculture could offset about 40% of the estimated annual increase in CO_2 emissions (Robbins, 2004). Therefore, the implementation of this technology to the practice can lead to the reduction of carbon emission and slow down the process of climate change.

1.2.2 Economic benefits

The main economic advantages of CA are time saving and the reduction of cost (labour, fuel, machinery operating and maintenance). It is also main drive for farmers, who depend on family labour. However, the benefits of CA technology from the point of farmers' view are skeptical. Moreover, they are used to cultivate the field under the conventional agriculture and change their mindset requires special measures. To overcome such difficulties the government support, the consultation of NGOs and extension service agencies for explaining CA technology advantages are essential. Some Asian countries, namely China, India and Kazakhstan keep encouraging farmers to implement CA technology including as one of priorities in agrarian national programs. CA in African countries is initiated by both the states and the donor projects.

1.2.3. Social benefit

For long-term CA increases not only yield but also soil organic matter (SOM) and soil biological health. Furthermore, CA represents seventh and eighth goals of the Millennium Development Goals by 2015, which is connected with ensuring environmental sustainable as well as building a global partnership for development. Promoting CA globally along with FAO, the European Conservation Agriculture Federation (ECAF), which was established in 1999 as a non-profit making international association, held the first World Congress on Conservation Agriculture in 2001 in Madrid, initiating a series of such congresses: 2003 Brazil, 2005 Kenya, 2009 India, 2011 Australia, 2014 Canada (Friedrich, et al. 2014). World Bank (WB) is also among the proponents of implementing CA. In order to popularize the CA throughout the world, there is need more international, regional and national supports as well as projects and grants for scientists, scholars, extension workers and farmers to study the various aspects of the technology.

2. Data and Methods

In order to distinguish CA from conventional agriculture, there is given the comparison (Table 1) of both technologies. Obviously, conservation agriculture has more advantages with the exception of weeds issues. However, weed and pest problems are obstacle especially at

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the beginning of the CA adoption, with time the following problems are solved due to herbicide and pesticide applications. Moreover, the crop rotation as the one of the main principles of CA is preventing crops from spreading different plant pests, which commonly appear in monoculture.

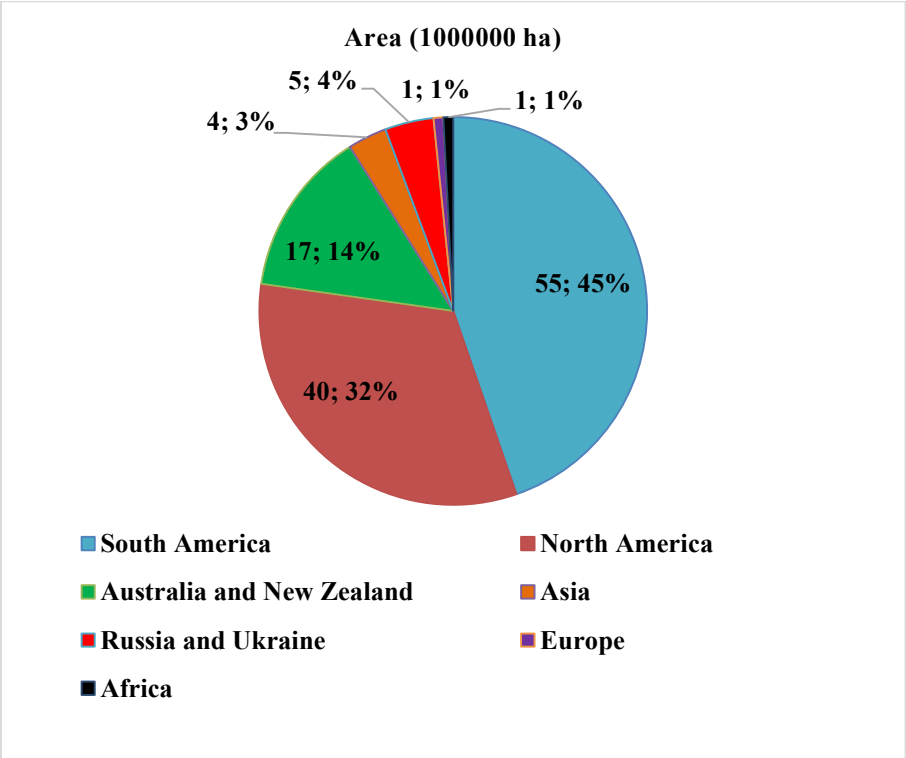
Table 1: Comparison between Conventional and Conservational Agricultures

No.	Issues	Conventional Agriculture	Conservation Agriculture
1.	Soil organic matter (SOM)	Lower	More
2.	Soil biological health	Lower	More
3.	Soil temperature	More variable	Moderated
4.	Soil compaction	Increased	Reduced
5.	Infiltration	Lower	More
6.	Erosion	Maximum	Less
7.	Weeds	Lower	More
8.	Cost	More	Lower

Source: Author

In global scale, CA in both Europe and Africa represent small portions accounting for 1% of world arable area (Diagram 1). With 3% of arable area under CA (more than 4 Mha) in Asia is reaching to Russia and Ukraine (both countries together about 5 Mha). The top three continents, which is intensively use this technology, are South America (44%), North America (32%) and Australia including New Zealand (14%).

Figure 1: Area under CA by continent



Source: Friedrich, T., Derpsch, R., & Kassam, A. (2012). Overview of the global spread of conservation agriculture

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Analysing the percentage of CA area out of country's arable land, where CA widely practises, it is increasing rapidly (Table 2). Despite extending the area under CA technology in several countries, globally it spreads around the world quite slowly. Europe, Asia and Africa are still considered as the developing continents of implementing this technology. There is the main challenge: changing farmers' mind set from the conventional tillage to CA. To overcome this issue, the government support and policy for CA are essential to conduct. Some Asian countries, namely China, India and Kazakhstan keep encouraging farmers to implement CA technology including as one of priorities in agrarian national programmes. CA in African countries are initiated by both the states and the donor projects.

Table 2: Total area of arable land within the country, area under CA and its percentage of arable land area

Country	**/ Year**	**2005**	**2008**	**2014**
Australia	Arable Land (1000 ha)	44 139	47 117	46 213
	CA area (1000 ha)	9 000	17 000	17 695
	CA area as % of arable land area	20.39	36.08	38.29
Country	**/ Year**		**2011**	**2013**
Finland	Arable Land (1000 ha)	N/A	2 249	2 224
	CA area (1000 ha)		160	200
	CA area as % of arable land area		7.114	8.993
Country	**/ Year**	**2007**	**2012**	**2013**
Kazakhstan	Arable Land (1000 ha)	28 641	29 332	29 395
	CA area (1000 ha)	600	1800	2000
	CA area as % of arable land area	2.095	6.137	6.804
Country	**/ Year**	**2007**	**2011**	**2013**
Argentina	Arable Land (1000 ha)	36 433	39 753	39 699
	CA area (1000 ha)	22708	27000	29181
	CA area as % of arable land area	62.33	67.92	73.51
Country	**/ Year**		**2011**	**2013**
Zimbabwe	Arable Land (1000 ha)	N/A	3 999	4 000
	CA area (1000 ha)		139.3	332
	CA area as % of arable land area		3.483	8.3

Source: Author's calculations based on the data of FAO-AQUASTAT, 2016

http://www.fao.org/nr/water/aquastat/data/query/index.html

As the one of economic advantages of CA is time saving, which attracts the most of farmers. Comparing CA with conventional tillage for mechanized operations (Table 3), it can be seen that for 1 ha there is need 6.17 hours under conventional tillage and 3.78 hours in CA. It shows that farmers can save 39% of their mechanized operations by implementing CA.

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Table 3: Mechanized operations and time required (hours/ha) for each of them under different bean production systems in Brazil

Operation	Conservation agriculture	Conventional tillage
Knife roller	0.89	-
Direct seeding	0.76	-
Spraying	1.2	0.6
Harvest	0.93	0.93
Ploughing/ disking	-	1.37
Levelling	-	1.38
Conventional planting	-	0.89
Ridging	-	1
Total	3.78	6.17

Source: Economic aspects of Conservation Agriculture, FAO 2015

http://www.fao.org/ag/ca/5.html

Land preparation activities is also time-consuming, they can involve to the process agricultural machinery, animal traction or manual work. Actually, manual work is typical for small garden. There are commonly used tractors or animal tractions in big farms. Comparing the time requirements for land preparation activities under conventional tillage with CA (Table 4), in conventional tillage for 1 ha farmers spend 2.9 hours by tractor and 33 hours with animal traction, as far CA there are need only 1.2 hours by tractor and 4.5 hours with animal traction. Such as big difference in time appears due to the practices of ploughing, harrowing and furrowing under conventional tillage, which is not implemented in CA technology.

Table 4: The time requirements for land preparation activities under conventional tillage and conservation agriculture

Conventional tillage		Conservation agriculture	
Operation	Time required (hours/ha)	Operation	Time required (hours/ha)
Tractor		**Tractor**	
Ploughing	1.5	Knife roller	0.9
Harrowing (2x)	1.4	Spraying	0.3
Total	2.9	Total	1.2
Animal Traction		**Animal Traction**	
Ploughing	25	Knife roller	3
Harrowing (2x)	5	Spraying	1.5
Furrowing	3		
Total	33	Total	4.5

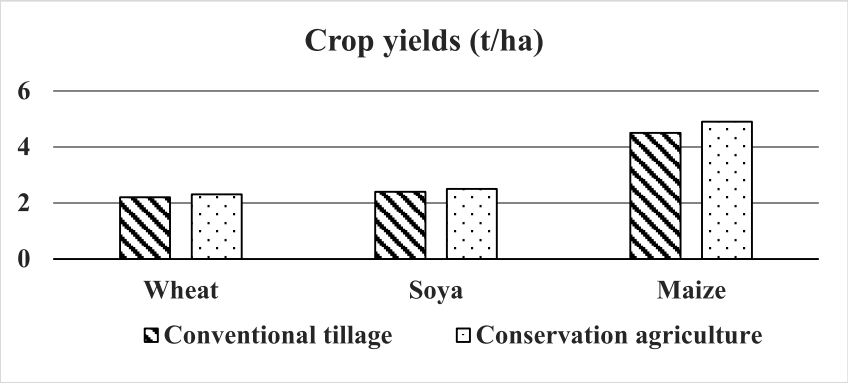
Source: Economic aspects of Conservation Agriculture, FAO 2015

http://www.fao.org/ag/ca/5.html

http://dx.doi.org/10.15414/isd2016.s2.07

Crop yields in CA can be the same or higher compared to conventional tillage system (Table 5). However, there is possibility that it can be lower at the beginning of CA implementation. With the appropriate management of residues, pests and weeds, CA gives its positive results for the long term.

Table 5: Wheat, soya bean and maize yields under conventional tillage and conservation agriculture (averages over a period over 8 years). Brazil



Source: Economic aspects of Conservation Agriculture, FAO 2015

http://www.fao.org/ag/ca/5.html

It should also be noted that during water deficiency period or uncomfortable climate conditions there are more crop yields in CA compared with conventional tillage because of residue on the surface, which keeps fields more moisture.

3. Results and Discussion

CA technology is getting more popular in South America, North America and Australia. Europe, Asia and Africa are considered as the developing continents of implementing this technology. The one of economic advantages of CA is time saving, which attracts the most of farmers. By implementing this technology farmers save 39% of working hours for mechanized operations and 59% working hours for land preparation activities with tractors. Crop yields in CA can be the same or higher compared to conventional tillage system for the long term and it can be lower at the beginning of CA implementation phase. The benefits of CA technology from the point of farmers' view are skeptical. In order to change their mindset, the support and policy by the government as well as specialized trainings by extension service agencies and NGOs are required. During implementing CA technology, there are need to pay careful attention on residue, pest and weed managements and follow the main principles of CA, and then expected results can be achieved.

4. Conclusion

CA technology is a climate resilient technology and management system that has demonstrated potential to secure sustained productivity and livelihoods improvements for millions of climate-dependent farmers. This technology is win-win situation, as it encourages sustainable agricultural development including itself environmental, economic and social values. Comparing CA with conventional agriculture, CA technology has more advantages. Despite the rapid development of CA in Americas, the overall adoption levels of CA in the world remain low. In order to popularize the CA technology, there is need international, regional and national support. Government policy, the trainings of extension service agencies

and NGOs play an important role for adopting and disseminating this technology, as there is prospective future for developing CA in Europe, Asia and Africa continents.

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Economic aspects of fresh apricot production in Turkey

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Abstract
Apricot production is one of most important activity in total world fruit production. It is important source for increase farmers profit in agricultural economy conditions of Turkey. Located at quite suitable conditions in terms of plant production considering its climate and field conditions. Turkey has ranked first in the world with 811,609 tons of apricot production in 2013 by 16.69% Main purpose of this study is to analyze the economic aspects of fresh apricot production between 2004 and 2013 in Turkey and to offer solutions for the encountered problems. Statistical data for 2004-2013, used in the study have been obtained from FAO and TurkStat, The Turkish Ministry of Food, Agriculture, and Animal Husbandry. Data obtained have been shown in the tables and graphs issued by the use of percentage and index calculations.

Keywords: *fruit, fresh apricot, agricultural marketing, economical analysis, Turkey*

JEL Classification: *Q1, Q19*

1. Introduction

Apricot production is one of major part of agricultural economy which is important source for increase farmer's profit and countries agricultural economy conditions. Apricot production takes a considerable part in agriculture production in Turkey located at quite suitable conditions in terms of plant production considering its climate and field conditions. Apricot (Prunus armenica) is one of the stone fruits. It is almost cultivated in all over world.

Turkey is one of the world's major producer countries. According to data of FAO for 2013, there are approximately 811,609 tonnes apricot produced in the world. Countries having the large producing apricot are respectively Turkey (19.74%), Iran (11.12%), Uzbekistan (10.46%), Algeria (7.78%), (Italy 4.82%).

Although the technical aspects of apricot production have been studied extensively, little information is available on the economic aspects of apricot production. In recent years, many studies have been made on the economic side of apricot production (Gezer et.al, 2003, Dellal, 2003; Olgun and Adanacioglu, 2006; Cukur et al., 2008; Ercisli, 2009; Gündüz, 2010; Ucar, 2011, Gündüz, et.al, 2011). One study has been done about input–output energy analysis in dry apricot production (Esengün et al, 2007) and also another study done about investment of apricot (Ucar and Saner, 2013). However, there is still a need for further study, especially at the local level. The main purpose of this study is to economic analysis of fresh apricot production in Turkey.

2. Data and Methods

Statistical data for 2004-2013, used in the study have been obtained from FAOSTAT and TurkStat. Data obtained have been shown in the tables issued by the use of percentage and index calculations.

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3. Results and Discussion

3.1 Fresh Apricot Production, Harvested Area and Yields in Turkey

Turkey has important apricot producer country. Apricot has grown almost all region of Turkey. The most apricot producer provinces are Malatya, Mersin, Elazıg, Kahramanmaras, Antalya. Although Malatya with 50.74% share of in the Turkey's apricot production took place in the first line in 2013 (TurkStat, 2015). In 2004-2013 period apricot production increased from 350,000 tones to 811,609 by rising in the rate of 231.89%. Mainwhile, Apricot harvested area increased 57,500 ha to 60,220 ha has rise by 28.46%. Yield reached to 13,477 kg in 2013 (Table 1).

Table 1 Apricot Production, Harvested Area and Yield in Turkey

Year	Production (ton)	Index (2004=100)	Harvested Area (ha)	Index (2004=100)	Yield (kg/ha)	Index (2004=100)
2004	350,000	100.00	57,500	100.00	6,087	100.00
2005	894,000	255.43	60,000	104.35	14,900	244.78
2006	483,459	138.13	53,400	92.87	9,053	148.74
2007	589,732	168.49	55,200	96.00	10,684	175.52
2008	750,574	214.45	58,000	100.87	12,940	212.60
2009	695,364	198.68	59,000	102.61	11,786	193.62
2010	476,132	136.04	59,801	104.00	7,962	130.80
2011	676,138	193.18	59,696	103.82	11,326	186.08
2012	795,768	227.36	60,732	105.62	13,103	215.26
2013	811,609	231.89	60,220	104.73	13,477	221.41

Source: FAO (http://www,fao.org.tr)

3.2 Fresh Apricot Marketing in Turkey

2004-2013 period Turkey fresh apricot grower price declined from 821.37$/tonne to 619,31$/tonne by 24.61%. There can be production fluctuations in the some years. The main reason of this is climate conditations. Due to unsuitable climate (frost), apricot production deacrease and this situation leads to an increase prices of apricot. In suitable climate years apricot production increase and it leads to an decrease price of apricot (Figure 1).

Generally fresh apricot is consumed domestically. There are some actors in fresh apricot marketing channel, farmer, trader, exporter, retail outlet, middleman (Figure 2). Turkey exported 41,583 tonne apricot and its export revenue has $ 42,444 in 2013 (Table 2). Apricot export to mostly Russia, Bulgaria, Iraq, Germany and Saudi Arabia is performed.

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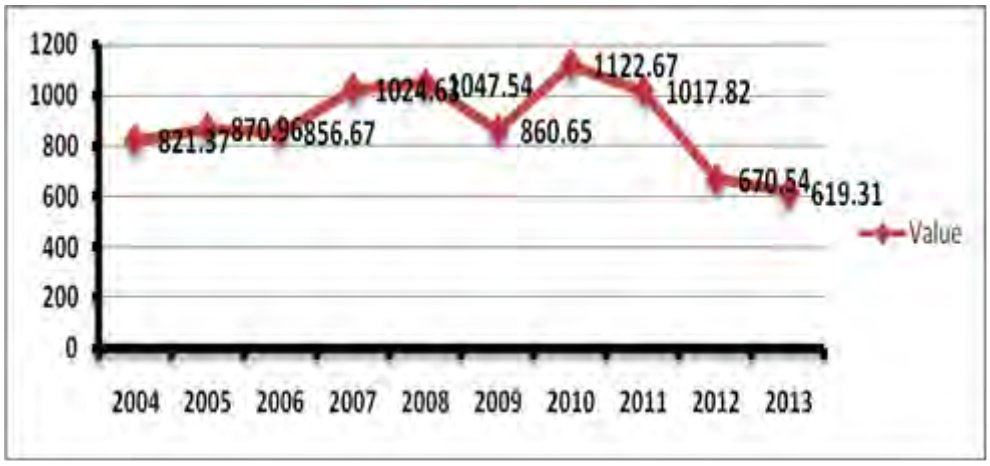
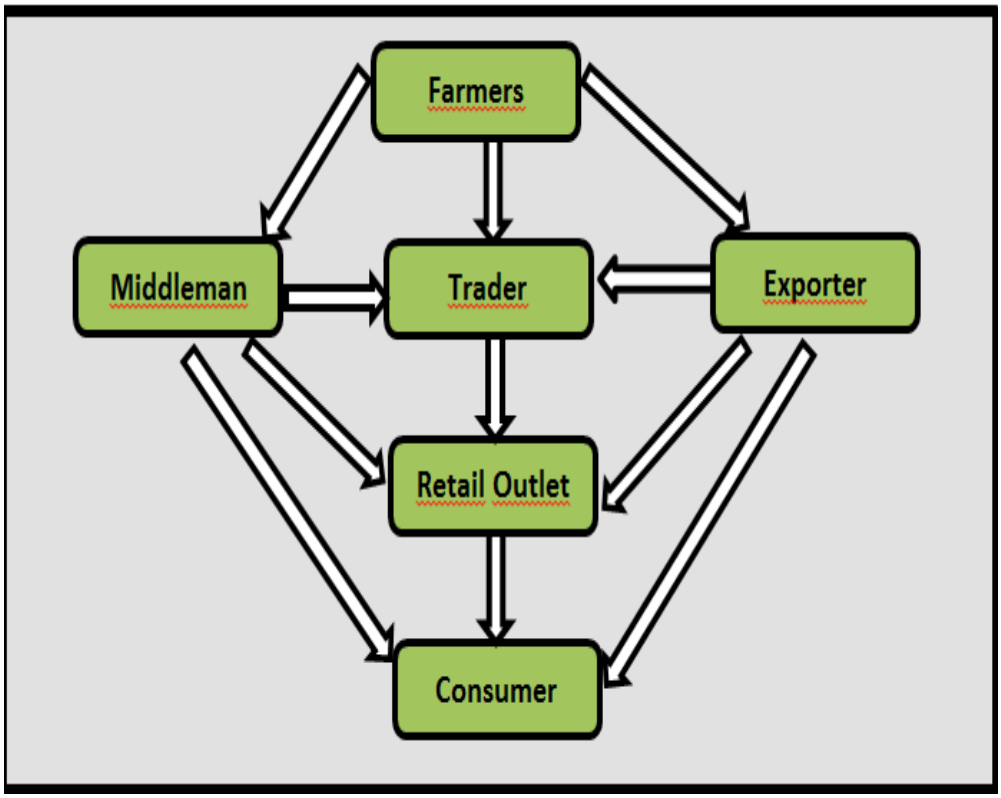
Figure 1. Fresh Apricot Grower Prices ($/ton) in Turkey



Source: FAO (http://www. fao.org.tr)

Figure 2. Fresh Apricot Marketing Channel in Turkey



Source: Firat Development Agency (http://www.fka.org.tr/)

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Table 2 Fresh Apricot Export Quantity and Value of Turkey

Years	2004	2008	2010	2012	2013
Export quantity (ton)	79,310	22,101	25,845	56,302	41,583
Export value (1000 $)	95,780	11,043	26,641	41,613	42,444

Source: FAO (http://www.fao.org.tr)

3.3 Government Supports for Apricot Growing in Turkey

There is no direct government support policy for apricot production in Turkey. However, growers benefit from the general support policies pursued in agricultural production. Apricot procedures are supported by agricultural investments, and input and export support within the context of government support policies. The Agricultural Bank of Turkey has provided investment and special project credits to support growers. Furthermore, short-term credit support is provided to growers by Agriculture Credit Cooperatives. Further In 2014, subsidy practises by the Turkish Ministry of Food, Agriculture, and Animal Husbandry for growers are presented in Table 3.

Table 3 Subsidy Practises for Apricot Growers in Turkey (2014)

Subsidy practises	Unit subsidy ($/ha)
Soil analysis	12.01
Fuel	22.10
Fertilizer	28.83
Organic production	336.40
Good agricultural practices	720.84

Source:The Turkish Ministry of Food, Agriculture, and Animal Husbandry (http://www.tarim.gov.tr)

3.4 Profitability Analysis of Fresh Apricot in Turkey

Variable and fixed cost form total production costs of fresh apricot. The variable costs include costs for labor, fertilizer, electricity, marketing, transportation, and interest on total variable cost. Variable costs are calculated by using current input prices and labor costs. The fixed costs include interest on total variable costs, annual depreciation costs, administrative costs, and land rent. Total costs are subtracted from total gross return to calculate the net return (Engindeniz et al, 2003; Engindeniz et al, 2006).

The results of conducted studies in different regions on profitability of fresh apricot in Turkey are presented in Table 4.

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Table 4 Results of Previous Studies on Profitability of Fresh Apricot in Turkey

Region	Yield (kg/ha)	Price ($/kg)	Total gross return ($/ha)	Total cost ($/ha)	Net return ($/ha)
Malatya *	9020,00	0,78	7035,60	3699,33	3336,27
Igdır **	12810,10	0,41	5252,14	2555,95	2696,19
Malatya ***	10000,00	0,62	6200,00	3267,14	2932,86

*Saribas, 2012, **Fidan, 2009. ***The Turkish Ministry of Food, Agriculture, and Animal Husbandry Malatya Provincial Directorate, 2015.

4. Conclusion

Apricot production takes a considerable part in agriculture production in Turkey. It grown all part of Turkey due to suitable climate Malatya province is provided a significant portion of apricot production. Apricot growing is popular among the farms located suitable climate conditions. However, there are problems associated with fresh apricot production and marketing. Understanding the causes of these problems can indicate the type of research that is needed to improve fresh apricot production. Growers must evaluate circumstances to determine if the lower price usually paid by wholesalers and supermarkets is sufficient to cover production and handling costs and can be get a profit. Most apricot growers do not consider marketing and cost interaction and thus results in economic failure. Some suggestions for improving apricot production in the Turkey as follow;

- Suitable planting spaces should be preferred.
- Growers should be informed about Integrated Pest Management.
- Contract farming systems should be developed.
- Irrigation cooperatives should be improved.
- Growers should be informed about crop insurance.

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SESSION 3

The agri-food value chain analysis: economics, managmenet and logistics

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Agro – ecological modernization of agriculture for sustainable development

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Abstract
Agriculture is facing many challenges because of dominating industrial model of agricultural intensification. Current structure and design of farming systems contribute to unsustainable dependence on non – renewable sources of energy and their derivatives, including mineral fertilizers and pesticides. The article describes results from the long term field experiment on chernozem soil of the Balti steppe (Republic of Moldova) with different crop rotations and continuous cropping. Higher diversity of crops in crop rotation is crucial for improving soil health and functionality, in reducing the dependence from industrial inputs.

Key words: *crop rotation*, *soil fertility, fertilization, soil organic, matter, chernozem soil*

JEL Classification: *Q56*

Introduction

The concept of green revolution has contributed initially to significant yield increase for majority of crops. Unfortunately, industrial model of agricultural intensification has failed to consider fundamental agronomic and ecological principles of resource use for long – term, sustainable productivity. As a result many economic, ecologic and social problems have appeared because of: - high reliance on non – renewable sources of energy and their derivatives (mineral fertilizers, especially nitrogen, and pesticides for weed, pest and disease control);
- pollution and degradation of natural resources, including soils;
- reduction of biodiversity in the above – and below ground strata of the soil profile with negative consequences on ecosystem and social services provided by soils;
- higher vulnerability to climate changes and small resilience capacity as a result of lower biodiversity at the landscape and field levels, intensive moldboard plowing and significant annual uncompensated mineralizational losses of soil organic matter etc.

The above mentioned problems are in great extent the consequences of dominating industrial model of agricultural intensification, based on simplistic (reductionistic) approach to farm management. The new paradigm of agricultural intensification should be based on holistic (systemic) approach to farm management, including respecting the agro – ecological principles for sustainable development.

Results obtained in the long- term field experiment with crop rotation and permanent (continuous) cropping at Selectia Research Institute of Field Crops (Balti, Republic of Moldova) are proving this statement.

Materials and methods.

Research trials have been conducted in a long- term field experiment with different crop rotations and permanent crops under prevalent soil and climatic conditions of the Balti steppe, Republic of

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Moldova. The field experiment began in 1961/1962 in crop rotations and in 1964/1965 in the permanent crops. The average amount of precipitation in this region is 450 – 550 mm with high fluctuations in dry (271 – 374 mm) and humid years (711 – 903 mm).

The soil of the experimental field is typical cernozem: a heavy clay with 4.5 – 5.0 percent organic matter (Tiurin); pH (water) 7.3; pH ($CaCl_2$) 6.2; and total NPK of 0.20 – 0.25; 0.03 – 0.11 and 1.22 – 1.28 percent, respectively

Eight ten fields crop rotations are studied with different level of saturation with raw crops – from 40 up to 70%, including sugar beet – from 10 up 30%; sunflower – from 10 up 20%; corn for grain – from 20 up to 40%. Winter wheat has the same level of saturation in all crop rotations – 30%, but it is grown in three fields after different predecessors,: early harvested predecessors (vetch and oats for green mass; winter vetch and winter rye for green mass; alfalfa on the third year after first cutting); corn for silage and corn for grain. Each field for growing winter cereal crops after early harvested predecessors and after corn for silage is divided in two parts: on one half new (modern) varieties of winter wheat are grown, recently released by RIFC and on the other half older variety are grown – Odesa 51; after corn for grain on the one half of the field Odesa 51 is grown and on the other half – winter barley. The size of each experimental plot is 264 sq.m and the experiment has three repetitions in the crop rotations. The size of the experimental plots for permanent crops is equal to 465 sq.m, without repetitions.

The fertilization system in the crop rotations are in accordance with crop design and recommended rates of organic and mineral fertilizers in the region. The same is attributed to the system of soil tillage in crop rotations.

Results and discussions

The yields of winter wheat have grown initially since 1962 until 1980 – 1985, when a stabilization was noticed followed by yield decreasing (fig.1).

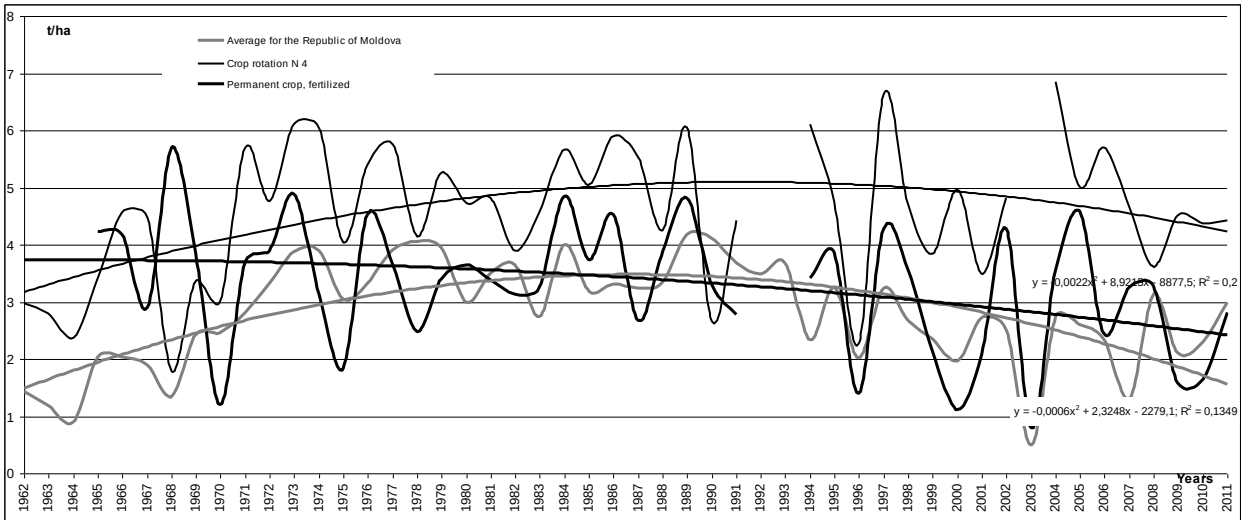

Fig. 1. Yields of winter wheat in the long-term field experiment of the RIFC "Selectia" (crop rotation and permanent crop) and in average for the Republic of Moldova, 1962-2011, t/ha

The same tendency was determined for winter wheat sown after corn for silage, but at the lower level. Winter wheat in continuous cropping was the less productive. Stabilization and decreasing the level of yields during the last 25 – 35 years is the result of both soil fertility reduction and

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climate changes, with more often manifestation of drought years. This situation is typical for the majority of crops in the long- term field experiments and is raising the issue of food security, especially in the conditions of global warming.

Yields of all crops are higher in crop rotations than in permanent crops, both on fertilized and unfertilized plots (tab.1).

Tab.1 Effect of crop rotation for different crops on fertilized and unfertilized plots in the long- term field experiments of the Selectia Research Institute of Field Crops, average for 2004 – 2013 years

Crops	Crop rotation			LSD 0.05	Permanent crops			Effect of crop rotation			
	unfer.	fertil.	± t/ha and %		unfer.	fertil.	± t/ha and %	unfertilized		fertilized	
								± t/ha	%	± t/ha	%
Winter wheat	4.45	5.00	+0.55/12.4	0.20	1.84	3.07	+1.23/66.8	+2.61	141.8	+1.93	62.9
Sugar beet	25.12	35.74	+10.62/42.3	2.1	5.00	9.20	+4.2/84.0	+20.12	402.4	+26.5	288.5
Corn for grain	5.20	5.81	+0.61/11.7	0.27	3.17	5.14	+1.97/62.1	+2.03	64.0	+0.67	13.0
Sunflower	1.96	2.17	+0.21/10.7	0.19	1.34	1.72	+0.38/28.4	+0.62	46.3	+0.45	26.2

The effect of fertilization (the extra yield on fertilized relatively to unfertilized plots) is higher in permanent cropping than in crop rotation, especially for sugar beet. The effect of fertilization was very low in crop rotation, especially for such crops as: winter wheat, corn for grain and sunflower (tab.1).

The effect of crop rotation (the difference between yields of crops grown in crop rotation and in permanent crops) was different for different crops and it was influenced in great extent by fertilization (tab.1).

The highest effect of crop rotation was achieved on unfertilized plots especially for such crops as: sugar beet and winter wheat (20.2t/ha / 402.4% and 2.61 t/ha / 141.8%, respectively). The effect of crop rotation has decreased under the influence of fertilization for the same two crops, but fertilization didn't replace the beneficial influence of crop rotation (26.54 t/ha / 288.55% and 1.93 t/ha / 62.9 %, respectively for sugar beet and winter wheat).

Experimental data are proving that by respecting crop rotation with a higher diversity of crops it is possible to reduce considerably the dependence from mineral fertilizers. Simultaneously, crop rotation allow to reduce also the expenditures connected with the utilization of pesticides for weed, pest and disease control, because mineral fertilizers are increasing the level of crop infestation with weeds, pests and diseases (data are not shown here). By growing crops

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continuously on the same plots we have to compensate the incapacity of root system to provide nutrients and water by extra amount of nutrient from mineral fertilizers and water from irrigational water. It indicates on soil functionality and soil quality (soil health) and consequently on the capacity of soil to provide ecosystem and social services. The danger of soil, water and products pollution is higher in continuous cropping than in crop rotation.

Crop predecessors are crucial for a better ecological management of crops(tab.2).

Tab.2 The yield of winter wheat (variety Odesa 51) after different predecessors on fertilized and un-fertilized plots in the long- term field experiment at Selectia Research Institute of Field Crops, average for 1994 – 2011, t/ha and %

Predecessors	Crop yields		±from fertilization	Reduction of yield comparatively with early harvested predecessors	
	unfertilized	fertilized		unfertilized	fertilized
Vetch and oats for green mass	4.20	4.54	+0.34/8.1%	-	-
Corn for silage	3.30	4.01	+0.71/21.5%	-0.90/21.4%	-0.53/11.7%
Corn for grain	2.57	3.59	+1.02/39.7%	-1.63/38.8%	-0.95/20.9%
Winter wheat (permanent crop)	1.95	2.84	+0.89/45.6%	-2.25/53.6%	-1.7/37.4%

The better are predecessors of winter wheat the lower is the efficiency of mineral fertilizers. The effect of fertilization is significantly higher after late harvested predecessors and, especially, in continuous cropping of winter wheat. So, the extra yield of winter wheat from fertilization by sowing winter wheat after vetch and oats for green mass has consisted 0.34 t/ha (8.1%), but after corn for silage, corn for grain and continuous winter wheat – 0.71 t/ha (21.5%); 1.02 t/ha (39.7%) and 0.89 t/ha (45.6%), respectively. If to determine the yield reduction of winter wheat by sowing after late harvested predecessors relatively to early harvested predecessors both on fertilized but, especially, on unfertized plots, it is obvious that they are the same or even higher, especially, for continuous winter wheat, than the extra yield from fertilization. From agronomic, ecologic and economic points of view it doesn't make sense to compensate the lack of good predecessors and crop rotations by higher rates of mineral fertilizers and consequently pesticides for weeds, pests and diseases control.

Building soil fertility and improving crop yields were always two closely interconnected (unseparated) aspects for achieving a sustainable productivity. Unfortunately, during the era of agricultural industrialization the importance of soil fertility was neglected. As integral index of soil fertility serves soil organic matter. We have determined the share of soil fertility in yield formation for different crops in crop rotation and in permanent crops (tab.3).

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Tab.3 The share of soil fertility in yield formation (%) for different crops in crop rotation and in permanent crops in the long- term field experiments at Selectia Research Institute of Field Crops, average for 2004 – 2013 years

Crops	Predecessors	Crop rotation		Permanent crops	
		unfertilized	fertilized	unfertilized	fertilized
Winter wheat	Vetch and oats for green mass	100	86.5	100	59.9
	Corn for silage	100	76.3		
	Corn for grain	100	70.3		
Sugar beet	Winter wheat	100	70.3	100	54.3
Corn for grain	Sugar beet	100	89.5	100	61.7
Sunflower	Winter wheat	100	90.3	100	78.0

It is evident that the share of soil fertility in yield formation is equal to 100% on control (unfertilized) plots. On fertilized plots the yields are formated under the influence of both soil fertility and applied fertilizers. The share of fertilizers in yield formation is equal to difference between fertilized and unfertilized plots (expressed in %).

The share of soil fertility in yield formation is the difference: 100% - the share of fertilizers in yield formation.

As it was mentioned before the effect of fertilization is lower in crop rotation and higher in continuous cropping. Consequently, the share of soil fertility in yield formation on fertilized plots is higher in crop rotations and lower in continuous cropping for all crops consisting for: winter wheat – 70.3 – 86.5% (according the predecessors); sugar beet – 70.3%; corn for grain and sunflower – 89.5 – 90.3%.

For crops in continuous cropping the share of soil fertility consists for: winter wheat – 59.9%; sugar beet – 54.3%; corn for grain – 61.7% and for sunflower – 78.0%. So, the share of soil fertility in yield formation is dominant even by using optimal rates of organic and mineral fertilizers. Taking care of soil fertility by preventing soil erosion and regular compensation of annual mineralization losses of soil organic matter is crucial for achieving a healthy and functional soil for long – term productivity.

Conclusions

1. Stabilization and yield decreasing for majority of crops in the conditions of global warming requires respecting the fundamental agro – ecological measures for sustainable development of agriculture, including for soil management. Reductionistic(simplistic) approach should be replaced by holistic (systemic) approach to farm management.

2. Yields of crops are higher in crop rotation than in continuous cropping. Applied fertilizers have reduced the beneficial influence of crop rotation, but the effect of crop rotation have remained high enough, especially for such crops as winter wheat and sugar beet .
3. Respecting crop rotation reduces the dependence of farms from mineral fertilizers and pesticides for weeds, pests and disease control.
4. The share of soil fertility in yield formation consists for different crops in crop rotation from 70 up to 90.3%. Regular addition of fresh organic matter at least for maintaining soil organic matter is crucial for healthy and productive soils.

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Analysis of burn-out syndrome of top and middle management

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Abstract
Disappointment from initial working ignition, working with other people and long term stress can cause serious problems, leading up to burn out syndrome. The aim of this study was to evaluate the relationship between the rate of burn-out syndrome and the length of professional experience of managers. As the object of the research, the managers from middle and top management in middle age from selected economy areas were chosen. For the collection of underlying data, the technique of questionnaire was used. The sample of respondents, 75 persons with return of 62 questionnaires, consists of representatives from areas of banking, construction and health care sector. We observed groups of respondents with the length of professional experience to 5 years, from 5 to 10 years, from 10 to 15 years, from 15 to 20 years, from 20 to 25 years and over 25 years. For primary data processing, the methods of quantitative statistics were used. The observed values of BM were increased in respondents in groups with the length of professional experience to 5 years and over 25 years in BQ range 3-4.The burn-out syndrome in these groups was not significantly confirmed. The observed results will be used within the frame of scientific activities and prevention.

Key words: *burn-out syndrome, manager, professional experience, prevention*

JEL classification: *E240 0180*

1. Introduction

Our constantly dynamically evolving society, extensive social and economic changes force people to permanently higher performances. Unfulfilled initial expectations at the point of integration to working process, similarly, long term dissatisfaction and overloading in work and in personal life as well and lack of ability of individuals to adapt to instant changes can lead up to the state referred to as burn-out syndrome.

The effect of excessive work- related stress ends in burn-out, as the employee feels mental and emotional exhaustion caused by long-lasting exposure and is involved in emotionally difficult situations (Maslach, 1993). Organizational stress is one of the main problems faced by organizations that affect job satisfaction (Kumar, Fisher, Robinson, Hatcher & Bhagat, 2007). In the development of burn-out the presence of undesirable organizational factors is more significant than other related factors (Schaufeli & Enzmann, 1998). It is important not only to deal with particular behavioural changes of an individual, but also to choose a reasonable approach of an employer to improve working conditions of employees. A person suffering from emotional exhaustion will have some degree of cynicism. Emotional exhaustion has been identified as the central quality of burnout (Maslach, Schaufeli & Leiter, 2001).

Cynicism refers to lack of self-esteem and employees becoming impersonal to co-workers. Cooper, Dewe and O' Driscoll (2001) suggested that it is a way of coping with draining emotions. Each of us has a different self-preservation capacity and a different ability to adapt to given

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circumstances. In the process of burning out the personality of an individual as one of the substantial factors should be pointed out. Each personality is unique and each of us reacts to situations that arise in a different way. Šuleř (2002) alleges that the features may determine a tendency towards particular behavioural trends. Interaction between our features and conditions influences out behaviour (Kassin, 2007). Burn-out syndrome was first named and published by a clinical psychologist Herbert J. Freudenberger in New York in 1974. In the following years a social psychologist Christina Maslach from University of California was dealing with the abovementioned problem (Marečková & Valentová, 2000).

Burn-out syndrome is not included in a list of mental disorders. In an international classification of disorders, burn-out syndrome can be found within the frame of diagnosis Z 73 "Problems related to life-management difficulty" and also in the category Z73-0 "Burn-out". Despite its demonstrably negative influence on performance in cultural and social conditions burn-out syndrome has not yet been classified as an occupational disease (Kebza & Šolcová, 1998, p. 13).

Burn-out syndrome is generally mentioned in connection with helping professions, such as doctors, nurses, social workers, psychologists, teachers, policemen. Burn-out can occur as a result of energy supplies consumption, which can today also appear in other professions (Gabura, 2005). We suppose that some people are at higher risk of burn-out due to the profession, that they exercise.

The aim of this study was to evaluate the relationship between the rate of burn-out syndrome and the length of professional experience of managers from middle and top management in the areas of health care, construction and banking sector.

2. Data and methodology

The object of the research was middle and top management managers in the areas of health care, construction and banking sector. The first group of respondents from the whole observed sample consists of private construction firm employees from Nitra region. In case of the banking area, we collaborated with bank employees from Bratislava region. In the area of health care, the observed sample was composed of doctors and nurses on manager positions at a hospital, also from Nitra region.

For the collection of necessary data, the strategy of quantitative inquiry was chosen. The research was carried out by a questionnaire and evaluated by mathematic – statistic methods. Standardized instrument questionnaire of psychological burn-out BM (Burn-out Measure) was used (Pines & Aronson, 1981). The Burnout Measure instrument focuses on three aspects of overall exhaustion – feelings of physical exhaustion (feelings of fatigue, overall faintness, feelings of weakness to loss of physical strength), emotional exhaustion (feelings of anxiety, despair to inconclusiveness of a situation) and mental exhaustion (feelings of helplessness, loss of human value and illusions of themselves and the world and feelings of loss of purpose of own existence) (Křivohlavý, 1998). It is made up of 21 items. Each item is evaluated on seven-point scale, which represents the feeling frequency of given statement (from 1-never, to 7-always). The burn-out degree evaluation was realized according to a manual (Křivohlavý, 1998). The evaluation of the items A, B, C, D, was carried out separately and consequently, the coefficient of the burn-out degree (BQ) was set out. The calculation of the item "A" was given by the sum of questions 1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and the last one 21. The item "B" was obtained by the sum of questions 3, 6, 19 and 20. We came to the item "C" by the deducting "B" from number 32. We established "D" by sum of "A" and "C" values. The final value of BQ was calculated by deduction of number 21

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from the item “D”. We determined the overall degree of burn out by the aforementioned method of BM.

Socio-demographic data were processed by analysis and comparison, calculated by arithmetic mean and percentage evaluation. We addressed 75 managers with the questionnaires from the mentioned economic areas. Overall return was 62 completely filled out anonymous questionnaires (82.60%). The same amount of copies in number 25 was delivered to each of the involved companies. From the construction company, 23 questionnaires from the examined sample were returned (92.00%) which represents 37.10% from the whole sample. The return from the bank was 18 questionnaires (72.00%) which constitutes 29.00% of respondents. In the health care institution, there were 21 completely filled out questionnaires (84.00%), which is 33.90% from the whole amount.

2.1 Examination of respondents´ identification data

Only 8 of the total number of selected persons were top managers (12.50%), of which male population was predominant, represented by 87.50%, female by 12.50%. The middle management represented 87.50% of the total number of respondents. Similarly, slightly more men than women are elected to positions in middle management. Mankind was represented by 53.70%. Out of our research sample, 46.30% women worked in middle management. Within the research sample, almost all of the respondents have completed tertiary education. 96.80% of the whole sample consisting of 62 managers have achieved Masters degree. Only 3.20% of the managers have completed secondary education.

Figure 1: Socio-demographic factors

Total number of respondents	62 / 100%

Level of management in %	
Top management	**12.50**
of which men	87.50
of which women	12.50
Middle management	**87.50**
of which men	53.70
of which women	46.30

Education in %	
Masters degree	96.80
Secondary education	3.20

Resource: Author

The sample of respondents was analyzed on the grounds of the number of working years (to 5, 10, 15, 20, 25 and over 25). The majority of the respondents belonged to the groups with professional experience from 5 to 15 years. Managers with professional experience to 5 years were represented by 17 persons (27.40%), with professional experience from 5 to 10 years by 16 persons (25.80%), from 10 to 15 years by 13 persons (21.00%), the group with professional experience from 15 to 20 years was represented by 7 persons (11.30%), from 20 to 25 years by 6 persons (9.70%) and the group with over 25 years of professional experience was represented by 3 persons (4.80%).

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Figure 2: Professional experience in %

to 5 years	27.40
from 5 to 10 years	25.80
from 10 to 15years	21.00
from 15 to 20 years	11.30
from 20 to 25 years	9.70
over 25 years	4.80

Resource: Author

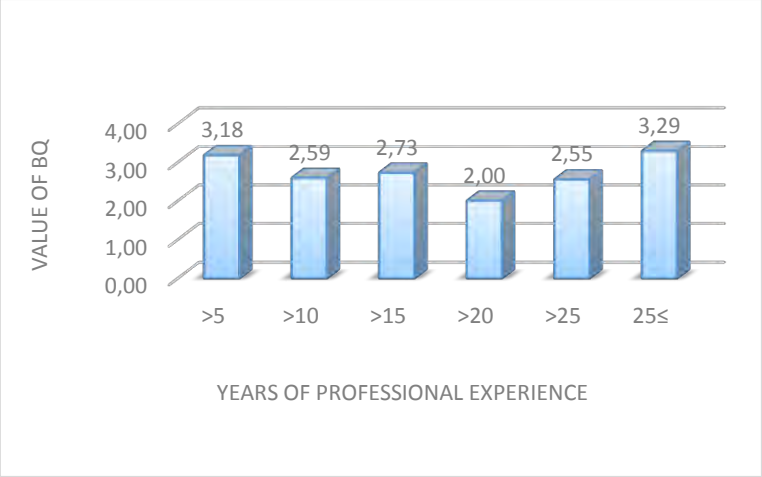
3. Results and discussion

Research sample consisted of the middle and top management managers. Due to a small number of managers from selected companies, respondents from two levels of management were chosen.

3.1 Evaluation of the degree of burn-out

By evaluating the degree of burn-out syndrome depending on the length of professional experience we discovered the highest values in the sample of respondents with professional experience over 25 years, with the average value of BQ 3.29. The value ascertained in the group of respondents with professional experience to 5 years was slightly lower, BQ was 3.18. The group of managers with the length of professional experience from 15 to 20 years had BQ value at level 2.00 (the lowest). The group of respondents from 5 to 10 years had the value of BQ 2.59, from 10 to 15 years BQ 2.73, in the group from 20 to 25 years BQ was 2.55.

Figure 1: Average degree of burn-out syndrome in relation to professional experience



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In the following phase, we compared the degree of burn-out syndrome of managers on the grounds of particular economic areas. At the bank, the highest rate of burn-out was in the period of professional experience to 5 years, where BQ reached the value of 3.12 and in the period of professional experience over 25 years, BQ had the value of 3.26. In the period of professional experience from 10 to 25 years values of burn-out degree from 2.55 up to 3.23 can be found.

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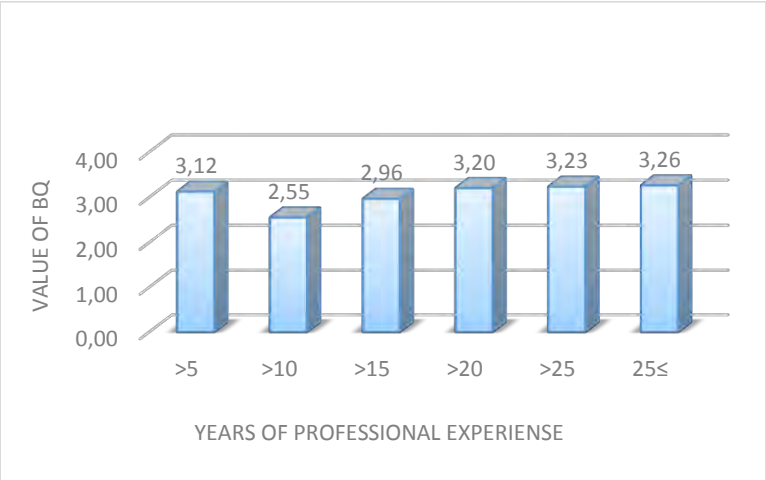
Figure 2: Average degree of burn-out syndrome in the bank



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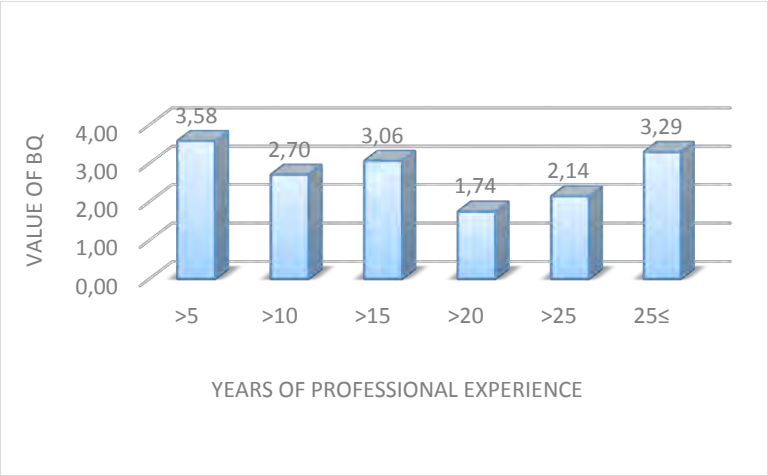
In the sample of construction firm managers, the highest average value of the burn-out degree BQ was 3.58 in the period to 5 years of professional experience and in the period over 25 years of professional experience. In the other periods, the values were slightly lower, which means, that in the period of professional experience from 5 to 10 years BQ was 2.70, in the period of professional experience from 10 to 15 years BQ was 3.06 and from 15 to 20 years 1.74 BQ as the lowest value was measured. In the period of working years from 20 to 25 years BQ represents the value 2.14.

Figure 3: Average degree of burn-out syndrome in the construction firm



Resource: Author

In the hospital sample, the highest were the average values in the period of professional experience over 25 years, where the average value of BQ was 3.33 and the average values in the period of professional experience to 25 years was BQ 2.94. Further, in the period from 5 to 10 years of professional experience, BQ was 2.44, in the period from 10 to 15 years of professional experience, BQ reached the value 2.28. The lowest BQ value 1.77 was comparable to the degree of burn-out in the construction firm, where BQ was 1.74. Professional experience from 20 to 25 years is represented by BQ value 2.50.

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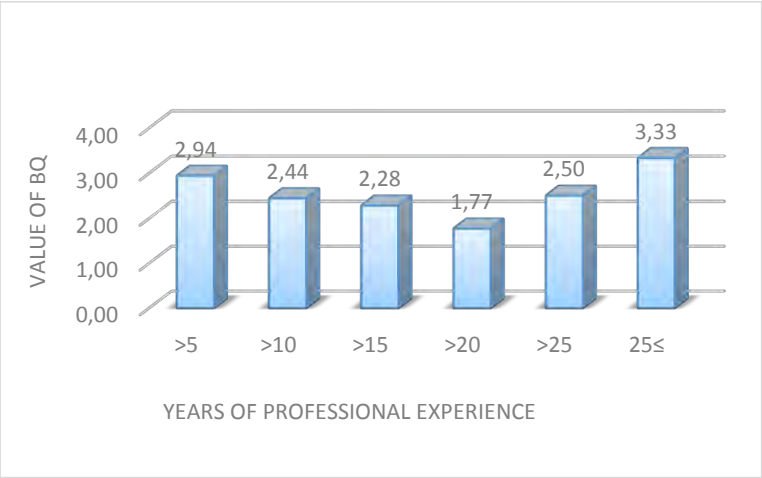
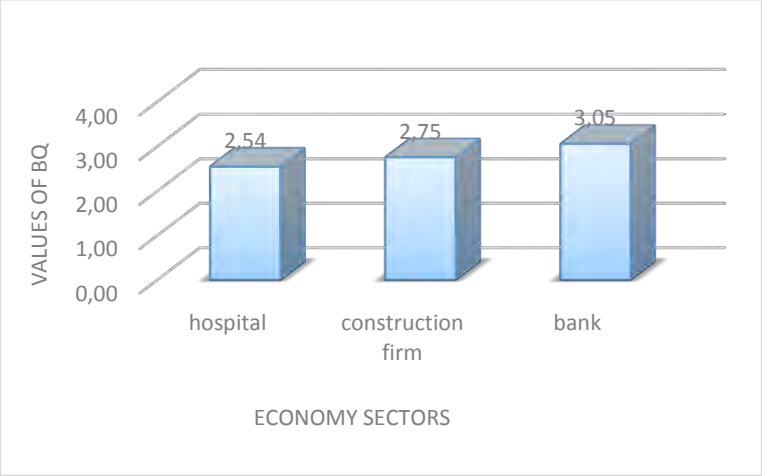
Figure 4: Average degree of burn-out syndrome in the hospital



Resource: Author

Increased overall average BQ value 3.05 of the burn-out degree was recognized in the bank, in the construction firm BQ reached the level of 2.75 and in the hospital, the value of BQ was 2.54.

Figure 5: Overall degree of burn-out syndrome based on the economy sector in relation to the length of professional experience



Resource: Author

In the hospital the overall average degree of burn-out had slightly lower value of BQ than in other researched economic areas.

3.2 Discussion

Increased and confirmed burn-out syndrome is known mainly in connection with helping professions. Therefore, in our research we precisely attempted to compare these professions, represented by doctors and nurses, with others. We focused on the degree of burn-out syndrome of managers from the private construction firm, the bank and the health care area. Up until now, given sectors have not been sufficiently analyzed in respect to the managers´ burn-out degree.

While comparing the final values, we came to a conclusion, that the highest burn-out degree based on the length of professional experience was confirmed at the bank. The highest burn-out rates

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based on the length of professional experience were discovered in the group of respondents with 25 years of professional experience. The threshold value of BQ more than 3.00 was confirmed also in the group of respondents with to 5 years and with from 15 to 25 years of professional experience.

In the construction firm, the highest values of BQ were confirmed in relation to the initial excitement of an employee in the period to 5 years of professional experience. Almost comparable results were in the group of respondents with over 25 years of professional experience. The lowest values of the burn-out degree in this particular area occurred in the period with from15 to 20 years of professional experience.

We had expected that the manager position burn-out syndrome values of doctors and nurses in relation to the length of professional experience were higher. Even though the difference between the BQ values was not major, the values were lower than in other economic areas. Therefore this presumption was not confirmed. Comparing the results of research from three observed sectors, we came to a conclusion that the lowest achieved overall values of burn-out were on the contrary in the health care area. In this particular group of respondents the highest rate of BQ was in the group of respondents with 25 and more years of professional experience. Slightly increased threshold value almost at the BQ level 3.00 was also in the case of managers with to 5 years of professional experience. Lower values were found in the group of respondents with from 10 to 25 years of working experience.

In the health care sector, a similar study was carried out by Heeb and Haberey-Knuessi (2014). In the study that focused on a group of managers of doctors and nurses from western part of Switzerland, in both groups of managers a low degree of burn-out was confirmed. In majority, a low degree of emotional exhaustion and depersonalisation was detected. A high degree of burn-out was confirmed only in 2.30% cases.

Canadian study of burn-out syndrome of medical department top managers was mainly carried out in teaching hospitals. In the researched sample of respondents, the overall burn-out was confirmed in 28.70%, emotional exhaustion in 37.00% and depersonalization in 10.40% of all cases (West, Halvorsen, Swenson & McDonald, 2013). A foreign study, which focused on the age of nurses as a risk factor while researching burn-out syndrome, pointed out the increasing risk as a result of the respondents´ aging. (Garrosa, Moreno-Jiménez, Liang & González, 2008). Prokelová and Jarošová (2012) chose as an object of their research nurses from neurosurgical department in Moravskosliezsky region in Czech Republic. Values of the burn-out degree in relation to the length of professional experience were the highest in nurses with the longest professional experience. Nurses at the age of 41 and more showed the highest value of the burn-out degree, nurses at the age from 20 to 25 the lowest.

Working stress and burn-out syndrome was compared within a research sample of Canadian managers and nurses. It was found, that stress correlates with burn-out in doctors as well as in nurses. Increased stress and burn-out syndrome in nurses came through as psychosomatic and health problems (Jamal & Baba, 2000). The research of a psychologist Prášilová (2000) focused on burn-out syndrome in healthcare professionals and social workers in state and private retirement homes in Czech Republic. She analysed the relationship between burn-out and the age and length of performed professional experience. The highest burn- out degree was reached by the respondents in the age group from 45 to 57 years. The least burned-out were the employees in the age group from 19 to 31 years.

In the whole sample made up of represented sectors, the highest average values of BQ were confirmed in the group of respondents with over 25 years of professional experience and almost comparable value was in the group of respondents with to 5 years of professional experience. These BQ values ranged from 3 to 4. High values of BQ were found only in unique cases, which accounts to 3.22%.

While interpreting the results of the BM questionnaire, Křivohlavý (1998, p. 36-39) from the psychological point of view considers the BQ range from 2 to 3 to be a satisfying state. In cases of values higher than 3 and lower than 4, he suggests to reflect on meaningfulness of life and work and rearrange the hierarchy of values. In case of a detected value which equals 4 and more it is necessary to consider "the presence of burn-out syndrome confirmed". In given cases, it is inevitable to intervene and to make essential precautions to prevent the deterioration of that particular state. If the value is 5 and more it is necessary to intervene immediately. The search for a help of a psychologist or a psychotherapist is strongly needed.

4. Summary

Burnt-out syndrome is a psychological and medical problem, which affects the quality of our life. In spite of managers´ hard work, in our case from several different economy areas, burn-out syndrome was not confirmed. Burnt-out syndrome occurred only in unique cases. We had assumed that managers from the hospital would have the highest value of the burnt-out degree. Given assumption was not confirmed. The highest BQ values were confirmed in managers from the bank. The bank employees pointed out that for them, the most stressful is communication with superior employees, overwhelming workload and lack of calm working environment. In a given case of burn-out syndrome, prevention is the most important necessity.

It is beneficial to establish conditions for effective and constructive communication between inferior and superior employees, to differentiate real working demands and to set out borders for work duties, to use methods of assertive behaviour, to create opportunities for education and development of the employees. Employers should contribute to an improvement of overall conditions of working environment. Only a satisfied and well-balanced employee is a benefit for each society.

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Estimating interaction between income and expenditures for food and non-alcoholic beverages in Slovakia

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Abstract
The main aim of the paper is to evaluate the relationship between incomes and expenditures for foodstuff categories, the level, and structure of expenditures and next statistical evaluation of their interaction. Budget shares and elasticity coefficients were estimated for food and non-alcoholic beverages consumption for the individual household categories according to the economical activity of head during the period 2004-2012. Using the aggregate data, we estimate the elasticities on income and price for the food demand in Slovakia. Knowing the values of demand elasticities for food is widely used approach to correct trade policy making and analysing trade patterns.

Keywords: *income, expenditures, foodstuff, elasticity, individual households' categories*

JEL Classification: *D12, D31, O52*

Introduction

In most EU countries final household consumption accounts for more than half of GDP (56.5 % of GDP in 2011). The consumption patterns are thus one of the most frequently discussed topics in theoretical as well as empirical literature. From the economic point of view is important to know the elasticities of disposable income or other variables and to be able to forecast the future development of the consumption and individual expenditures.

By 2010 in Slovakia the food expenditure ratio has dropped to about 16% for high-income households – a level comparable with demand patterns in the richer EU-15. The ratio is still quite high though, at about 26% for the low-income households (Rizov et al., 2015).

Michalek and Keyzer (1992), Abdulai (2002), and Chern et al. (2003) find that for majority of the population food demand is price and income inelastic and food is perceived as necessity rather than luxury.

The shares for food and non-alcoholic beverages increased, which would be consistent with the fact that household expenditures on basic needs tends to be more resilient than other consumption items in an economic recession. Regarding private households with lower incomes, it can be seen that basic needs (food, housing payments) take up a significant part of their budget in terms of the structure of their consumption.

In recent years, many households of the Central and East European countries have been exposed to the consequences of the process of their accession to the EU. This fact strongly influenced their situation on the market and caused changes of consumption patterns. Consumption is positively correlated with income level.

Rizov et al. (2014) note that the findings presented for Slovakia are consistent with studies from other developed countries, where food security does not present a significant challenge. Households tend to perceive food as a necessity rather than a luxury.

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Private consumption acts as an economy growth accelerator. Higher consumer spending means a faster development of the country. In particular, increasing consumer spending in the households of Central and Eastern Europe is accelerating the development of these countries.

Consumer expenditure patterns and estimates of expenditure elasticities can give an indication of the potential for demand-led growth in a particular economy. An expenditure elasticity is a measure of the responsiveness of expenditure on, or consumption of, a good to a change in real income, ceteris paribus (Tomek, Robinson, 2003) where expenditure is a proxy for income.

Data and methodology

We apply statistical evaluation to the Slovak Household Budget Survey (HBS) data collected by the Statistical Office of the Slovak Republic. The HBS data is commonly used for defining expenditures, incomes, social policy and for estimating household consumption in the national accounts. Applied dataset consists of annual levels from 2004 to 2012. Later data were publicised only as future predictions. The survey provides detailed information on private household incomes and expenditures on food and non-alcoholic beverages by economic activity of head.

The main aim of the paper is to evaluate the relationship between incomes and expenditures for main foodstuff categories, the level, and structure of expenditures and next statistical evaluation of their interaction.

In the estimation process the fixed effect specification of the panel data is used. Fixed effect specification is preferred in case of omitted variable problems in the regressions, by means of capturing idiosyncratic factors that might affected the demand and consumption for foodstuffs.

The fixed effect model assumes that individual specific time invariant effects should be treated as the intercept term of the regression. This presents opportunities for a number of transformations of the data, which eliminate this effect. Essentially, any transformation that rids the model of the fixed effect produces a fixed effect estimator (Baltagi, 2001).

The dependent variable is chosen to represent per capita expenditures on food and non-alcoholic beverages and explanatory variables which are price levels for food and non-alcoholic beverages and net cash income of the population. The coefficients are estimated with OLS method. Applied variables were the Consumer Price Index (CPI) for food and non-alcoholic beverages and net monthly income per capita in Euro.

Results

Analysis was oriented on the category expenditures of each private household group for food and non-alcoholic beverages as a major part of individual spending in the proportion of 22.6% for the period 2004-2012.

By 2012 the food and non-alcoholic beverages expenditure was 23.4% for high-income households – a level comparable with demand patterns in the richer EU-15. The ratio is still quite high though, at about 29% for the low-income households.

The trend of the annual indexes in net cash income and expenses for analysed period represents table 1. For a broader view, we have also incorporated into the table year over year indices of consumer spending and expenditure on food and non-alcoholic beverages.

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Table 1: Year over year indices of households' incomes and expenditures (2004 – 2012)

	index 05/04	index 06/05	index 07/06	index 08/07	index 09/08	index 10/09	index 11/10	index 12/11
Net Income in Total	103.95	113.86	112.05	109.78	99.67	99.53	103.67	101.26
Net Expenditures in Total	104.18	114.74	108.39	106.75	94.43	100.37	104.24	100.56
Consumption Expenditures	104.31	113.24	107.75	105.49	93.72	101.07	104.40	101.11
Expenditures on Food and Non-Alcoholic Beverages	102.23	106.73	106.45	105.87	92.37	103.45	102.69	103.10

Source: SO SR, own calculations

Net money incomes of Slovak households increased during period 2004-2008 year by year. In the year 2008 were by 45.58% higher than in 2004. In period 2009, 2010 incomes had declining trend, this was caused due to world financial crisis, private incomes decline due to increasing unemployment and inflation. During next two years of analysed period incomes started to increase and in 2012 reached their maximum 366.34 Euro per person and month. Income level increased from 2004 to 2012 by 51.6%. Very similar trend was also observed by the net total expenditures and expenditures on food and non-alcoholic beverages. The increased level of households' income allow them to spend more, thereby increasing their consumption. Income growth is accompanied by growth in consumption, with income growing faster than consumption, except for the crisis period (2009, 2010).

Main aim of research was estimation of interaction between net incomes and expenditures for main foodstuff categories. Results of quantitative analysis of expenditure on food and non-alcoholic beverages in individual households' categories are recorded in table 2.

Table 2: Estimation results of expenditure on food and non-alcoholic beverages modelling

	CPI	Income	R^2
Employee	0.5868**	0.4436***	0.9362
Self-employed	0.5280*	0.5418***	0.9281
Pensioners	0.4029	0.4082***	0.9369
Other	0.1688*	0.5677***	0.9196
Average household	0.5440	0.4484***	0.9686

Source: authors` calculations

* significant at α=0.1

** significant at α=0.05significance-

*** significant at α=0.01

Based on the statistical results we determine elasticity coefficients for the foodstuffs for analysed period 2004-2012. In recent years is evident increase of living standards according to the fact that the share of expenditures for food and non-alcoholic beverages on net household income is degressive.

Regression analysis confirmed the economic fact that the rise in prices has resulted in increased expenditure. Food needs are fundamental to our lives and therefore we cannot

drastically reduce the growth of prices. Any price increases will be reflected also in household expenditure.

The demand for food and non-alcoholic beverages is for all household categories income inelastic with strong significance. That confirm fundamentals of economic, that foodstuffs are normal necessities. Inelastic income reactions in the case of the others households category mean increase of yearly real level of incomes by 1% induced the rise in the given expenditures by 0.57%. Social household group of others is characterized by lower level of net incomes in comparison with other studied groups. The lowest income reactions have households of pensioners, 1% increase of the monthly income per capita should generate expenditure increase by 0.41% on food and non-alcoholic beverages

Spending for food is "price inelastic" for all household groups. This means that the percent change in quantities consumed of food and non-alcoholic beverages will be less than the percent change in their prices. Price elasticities for foods and nonalcoholic beverages ranged from 0.17 to 0.59. As an example, a 10% increase in foodstuff prices should increase expenditures by 1.7% to 5.9%. Although demand for food is relatively inelastic, the power of small price changes should not be underestimated given that their effects accumulate across a population. Higher elasticity estimates suggest greater changes in population purchases as prices shift. Richer households are slightly less sensitive to price changes, most inelastic foodstuff demand occured during analysed period in households of „others".

Conclusion

Reliable estimations of income, expenditure and price elasticities provides indispensable information for food chain markets. Household consumption patterns are investigated to determine the impact of an income shock on household expenditure. Budget shares and expenditure elasticities were estimated for food and non-alcoholic beverages consumption for the individual household categories according to the economical activity of head, allowing for a comparison of expenditure elasticities between the private household categories.

The analysed time period 2004-2012 can be characterized as a period of positive economic development in Slovakia. The real household consumption and also the disposable income grow over the whole period. Spending for food was "price inelastic" for all household groups. Results suggest that expenditure elasticities for food and non–alcoholic beverages were inelastic.

Economic shocks such as falling income in a recession or dramatic increases in food prices can lead to changes in purchasing behavior that are not necessarily predicted by elasticity estimates calculated with data collected under normal market conditions.

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Impact of sanctions on agricultural policy in European Union and Russia

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Abstract
In the springtime of 2014 the USA, the EU, some other countries and international organizations applied sanctions against Russia. This process started after joining of Crimea to the Russian Federation. In its tern Russia imposed retaliatory sanctions, which banned import of some agricultural products, raw materials and food products from the United States of America, the European Union, Canada, Australia and Norway. Authors analyzed international trade of the Russian Federation with the European Union changing for the sanctions period in comparing with previous one, forecasting on 2016. There is also evaluation of structure changing of Russian food products import from Europe in the article. The ban effected 4,2% of total EU agri-food exports. The European Commission's measures for the compensation, storage and promotion of sales market diversification for agricultural products are presented. New destinations and alternative markets for European agri-food export are considered. Impact of sanctions on the food products supply in Russia is monitored according to the internal market price changing. To the end of 2015 in comparing with 2013 the most suffered for embargo production items became frozen fish (with rising of the price on 52%), sunflower oil (on 43%), apples (on 38%), butter and meet of cattle (on 29%). While inflation rate in Russia was 11,36% and 12,91% for 2014 and 2015 years. After all authors reviewed priorities of contemporary agricultural policy of Russia. The main is focus on internal resources of agricultural development, which means broad federal support of agriculture. As a result Russia can become a strong supplier of agricultural and food products on the world market.

Key words: *sanctions, agricultural policy, food products, internal market, international negotiation*

JEL Classification: *F510, F520*

1. History of a question

On the 16th of March 2014 referendum about status of Crimea was organized. More than 80% of its population voted that the Crimea had to become a part of the Russian Federation. The United Nations did not declare the referendum. But Russia did it with regard to experience of Kosovo independence declaration in 2008. And on the 18th of March 2014 Russia signed an agreement with Crimea about joining of the Crimea to the Russian Federation. After that the USA, the EU, some other countries and international organizations applied sanctions against Russia.

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Russia responded with a one-year ban on imports of beef, pork, poultry, fish, cheeses, fruit, vegetables and dairy products from Australia, Canada, the European Union, the United States and Norway. (Adriel Kasonta, 2015)

In the current context, the most important is to react in a proportionate and rapid way should the situation arise. (European agriculture commissioner Dacian Ciolos, 2014)

The EU has introduced three waves of restrictive measures against Russia, which are regularly updated. While they hurt the Russian economy, the EU sanctions also have a boomerang effect, especially in conjunction with the countersanctions imposed by the Kremlin on EU food imports. (Tatia Dolidze, 2015)

2. European sanctions against Russia

In spite of the European Union was one of the biggest partners of Russia in the world economy, European restrictive measures were really severe, see table 1.

Table 1: Restrictive measures of the European Union for the Russian Federation after joining of Crimea to Russia

Council Decision 2014/512/CFSP (OJ L 229, 31.7.2014, p. 13) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0512
- embargo on arms and related materiel - embargo on dual-use goods and technology, if intended for military use or for a military end-user - ban on imports of arms and related materiel - (arms and related materiel related) ban on provision of certain services - (dual-use goods and technology related) ban on provision of certain services - (deep water, Arctic and shale oil related) controls on export of certain equipment for the oil industry - controls on provision of certain related services - prohibition of procurement from Russia of arms and related materiel - restrictions on issuance of and trade in certain 'bonds, equity or similar financial instruments' - prohibition to satisfy certain claims made by certain persons, entities and bodies - valid until 31.7.2016.
Council Regulation (EU) No 833/2014 (OJ L 229, 31.7.2014, p. 1) Corrigendum (OJ L 246, 21.8.2014, p. 59) http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0833 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0833R(02)
- embargo on dual-use goods and technology, if intended for military use or for a military end-user - (arms and related materiel related) ban on provision of certain services - (dual-use goods and technology related) ban on provision of certain services - controls on export of certain items for the oil industry (deep water, Arctic and shale oil) - controls on provision of certain related services - restrictions on issuance of and trade in certain securities and money-market instruments - prohibition to satisfy certain claims made by certain persons, entities and bodies

Source: EU restrictive measures in force (updated 15.1.2016).

It is necessary to notice, that from European side there were two amendments in 2014 and two ones in 2015, which added first list of sanctions (#512). As well as there were two amendments of the second list of restrictive measures (#833) in 2014 and one in 2015.

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3. Russian sanctions against Europe

In its tern Russia imposed retaliatory sanctions on the 6th of August 2014. They were special economic measures of security assurance of the Russian Federation. The presidential edict banned or limited import of some agricultural products, raw materials and food products from countries, which applied sanctions against Russia. According to this edict the Government formed list of banned import products from the United States of America, the European Union, Canada, Australia and Norway, see table 2.

Table 2: Russian list of banned import products from the United States of America, the European Union, Canada, Australia and Norway

The Customs Union commodity code	Name of product*)***)
0201	Meet of cattle, fresh or cooled
0202	Meet of cattle, frozen
0203	Pork, fresh, cooled or frozen
0207	Meet and edible offal of fowl, listed in commodity item 0105, fresh, cooled or frozen
from 0210**	Salted, in brine, dried or smoked meat
0301, 0302, 0303, 0304, 0305, 0306, 0307, 0308	Fish and crustaceans, mollusks and other water invertebrates
0401, 0402, 0403, 0404, 0405, 0406	Milk and dairy products
0701, 0702 00 000, 0703, 0704, 0705, 0706, 0707 00, 0708, 0709, 0710, 0711, 0712, 0713, 0714	Vegetables, edible roots and tuber crops
0801, 0802, 0803, 0804, 0805, 0806, 0807, 0808, 0809, 0810, 0811, 0813	Fruits and nuts
1601 00	Sausage and analogous meat and blood products, other same food products
1901 90 110 0, 1901 90 910 0	Prepared products, including cheese and curd of vegetable fat
2106 90 920 0, 2106 90 980 4, 2106 90 980 5, 2106 90 980 9	Food products (products, contained milk of vegetable fat)
* The Customs Union commodity code is the main for this list using, name of product is just for ease. ** The Customs Union commodity code and name product have equal meaning for this item using. *** Infant food products are exception.	

Source: Decree of the Government of the Russian Federation from The 7 of August 2014 # 778.

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The list was valid during one year, but on the 24th of June 2015 it was prolonged till the 6th of August 2016.

4. Analysis of Russian-Europe food products trade for 2014-2016

As a result of sanctions there is decrease of international trade between Russia and Europe. Dynamic of export from Russia to EU, import to Russia from EU, trade turnover and share in the total Russian trade turnover are presented in table 3.

Table 3: International trade of the Russian Federation with the European Union for 2012-2015, in mil. doll.

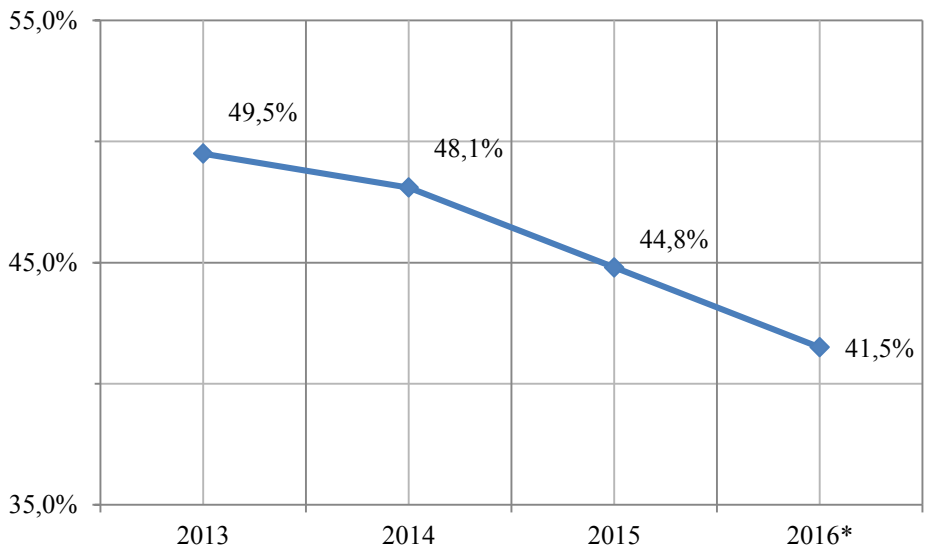
	2012	2013	2014	2015
Turnover	409599,7	416515,9	377538,6	235722,9
Export	277085,8	282237,9	259051,7	165566,2
Import	132513,9	134278,0	118486,9	70156,8
Share in the total Russian turnover, %	48,6	49,5	48,1	44,8

Source: Federal Customs Service of Russia data.

As to trade turnover between Russia and Europe, it fell down on 9% after first wave of sanctions till the end of 2014 and on 38% after second one till the end of 2015. At the same time Russian export to the European countries became on 8% lower in 2014 and on 36% in 2015. When Russian import from the EU fell down till 12% and 41% in 2014 and 2015.

From 2013 to 2014 and from 2014 to 2015 share of international trade with Europe in the total Russian turnover is falling down. The first descending was on 1,4% only, when the second became on 1,9% higher and attended 3,3%. This tendency can lead to the falling on 3,3% more down to 41,5% at the end of 2016 (according to the extrapolation method). It will means, that the gap will rise up to 8% for last 3 years from 2013, see draft 1.

Figure 1: Dynamic of EU's share in the total Russian trade turnover for 2013-2016, with forecast on 2016



There are no doubts, that this process is a consequence of sanctions. Let's analyze structure changing of Russian food products import from Europe. To the end of 2014 import growth of

- meat products group was about -82,9%,
- fish and crustaceans, mollusks and other water invertebrates was about -40,5%,

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- milk products was about -34,1%,
- meat and fish contained food products was about -33,8%,
- fruits and nuts was about -33,1%,
- vegetables was about -32,5%,
- other food products, contained milk of vegetable fat was about -7,8%,
- milk and flour contained food products was about 10%.

From products group to group decrease became different. Last researching group already had a real growth in 10%. This changing reflects only how many products items were banned in the whole products group.
In comparing with 2015, reductions, mentioned above, seem not so enormous, see table 4. Even if we regard data for 9 months of the year, the situation is utterly terrible.

Table 4: Russian import of main food products from the European Union for 2013-2015

CU code	Name of products group	2013		2014		2015*	
		Value, mil. doll	Share, %	Value, mil. doll	Share, %	Value, mil. doll	Share, %
	Total, including:	134278,0	100,0	118486,9	100,0	51120,71	100,00
02	Meat	2124,9	1,6	363,4	0,3	6,23	0,0122
03	Fish and crustaceans, mollusks and other water invertebrates	216,1	0,2	128,6	0,1	0,44	0,0009
04	Milk and dairy products	1897,1	1,4	1250,5	1,1	184,26	0,3604
07	Vegetables, edible roots and tuber crops	935,1	0,7	631,1	0,5	40,81	0,0798
08	Fruits and nuts	1519,6	1,1	1015,9	0,9	0,24	0,0005
16	Meat and fish contained food products	260,6	0,2	172,6	0,1	44,59	0,0872
19	Milk and flour contained food products	815,9	0,6	898,4	0,8	375,17	0,7339
21	Other food products	1039,1	0,8	958,0	0,8	414,22	0,8103

Source: Federal Customs Service of Russia data. * for 9 months.

After the second wave of sanctions the situation changed dramatically. Share of products groups, including banned products, decreased quickly in total Russian import from Europe.

The main descending is accounted for:

- fruits and nuts products group with share in total import 0,0005% for 9 months of 2015 in comparing with 0,9% for 2014;
- fish and crustaceans, mollusks and other water invertebrates products group with share in total import 0,0009% for 9 months of 2015 in comparing with 0,1% for 2014;
- meat products group with share in total import 0,0122% for 9 months of 2015 in comparing with 0,3% for 2014;
- vegetables, edible roots and tuber crops products group with share in total import 0,0798% for 9 months of 2015 in comparing with 0,5% for 2014.

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5. Impact of sanctions on EU market

In 2013, Russia was the second important destination for EU agri-food sector exports, after USA, representing in total a value of about 11.8 billion Euro in 2013 (10% of all EU agri-food exports). The agri-food products covered by the Russian ban represented a value of 5.1 billion EURO in 2013 exports, (43% of EU agri-food exports to Russia). The ban effected 4.2.% of total EU agri-food exports. These trade restrictions putted serious pressure on EU agriculture and food sector due to of temporary loss. It is needed to write that this happed in the full harvested season.

For EU it was necessary to ensure 3 main targets:

- to maintain stability of the internal market via effective and properly calibrated market crisis management at EU level (reducing overall supply of exposed products on the European market as and when price pressures become too great)
- to address negative impacts of the restrictions on some vulnerable EU sector by compensation.
- to strengthen the resilience of our agricultural and food sector and encourage reorientation towards new markets and opportunities.

Since August, 2014 the European Commission has introduced a number of measures for the compensation, storage and promotion of sales market diversification for EU agricultural products:

✓ Market measures (market withdrawals especially for free distribution and compensation for non-harvesting and green harvesting):

• 11.08.201442: Exceptional measures to assist peach and nectarine producers (EUR 32.7 million).

• 18.08.201443: Emergency market measures to support EU producers of perishable fruit & vegetables (up to EUR 125 million to fund withdrawals for free distribution or other destinations), green harvesting and non-harvesting of perishable fruit and vegetable most immediately impacted by the Russian measures, with a ceiling of EUR 82 million for apples & pears and EUR 43 million for the other fruit & vegetables).

✓ Suspended on 10.09.2014, due to application problems and abuse (e.g. Poland). It is to be replaced by a more targeted and coordinated scheme.

• 29.09.201444: Announcement of a EUR 165 million package for perishable fruit and vegetable market support.

✓ Private storage aid for milk and milk products:

• 28.08.201445: Emergency market support measures for the milk sector (butter, skimmed milk powder and cheese).

✓ Suspended for cheese on 23.09.201446, due to abuses.

✓ Promotion of EU agricultural products:

• 03.09.201447: An additional EUR 30 million of EU funding for CAP promotion programs (2015).

The European Commission has currently announced it will extend support measures for the dairy and fruit and vegetable sectors hit by Russia's ban on food imports from Europe, which has been in place for a year. Aid for the dairy sector will be prolonged until 29 February 2016 while support for fruit and vegetable producers will be continued until 30 June 2016, the Commission said on Thursday (30 July). Aid for farmers will be allocated to EU countries that have exported significant quantities to Russia over the past three years.

Over the entire period since the embargo started, the EU agri-food sector has managed to compensate the losses in export sales to Russia by increasing exports to other main destinations and alternative markets. Major gains in export values have been achieved in the

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US (+16%), China (+33%), Switzerland (+5%) and in a number of key Asian markets, such as Hong Kong (19%) and the Republic of Korea (+29%). European exporters have increased their exports also to certain Arab countries: Saudi Arabia (+10%), United Arab Emirates (+14%) and Egypt (+26%).

Analysing EU exports to third countries of the sectors affected by the embargo, in the period August 2014-July 2015, export values of bovine and poultry products increased by 23% and 5% respectively while the value of pig meat exports was in line with the previous year. Concerning dairy products, the value of butter exports fully recovered from the initial difficulties and achieved +3 % (compared to the 12 months period a year ago) due to an increase on Middle East markets. For cheese and milk powders, however, export values still lag behind: -14%, -10%, and -24% respectively. Also, concerning fruit and vegetables, the value of exports registered is still around 12% lower compared to the period one year before.

The EU countries potentially worst affected are the Baltic States, Finland and Poland Germany and the Netherlands (in absolute values). However, the share of agriculture in EU GDP (1.7 %) and in EU exports (6.6 %) is relatively low.

The worst affected countries are:

- Lithuania (vegetables, fruit, dairy products); (EUR 927 million - affected in terms of absolute value in 2013);
- Latvia (fruit and vegetables, dairy products);
- Cyprus (fruit and fish);
- Poland (fruit and vegetables); (EUR 841 million - affected in terms of absolute value in 2013);
- Belgium (fruit and meat);
- Spain (fruit and vegetables);
- Greece (fruit and vegetables, cheese);
- Denmark (dairy products, fruit and vegetables, meat);
- Estonia (dairy products);
- Finland (dairy products);
- United Kingdom (fisheries products/mackerel).

The sectors potentially worst affected in terms of absolute value are:

- dairy products (EUR 1,35 billion in 2013);
- fruit (EUR 1,26 billion);
- meat and sausages (EUR 1.26 billion).

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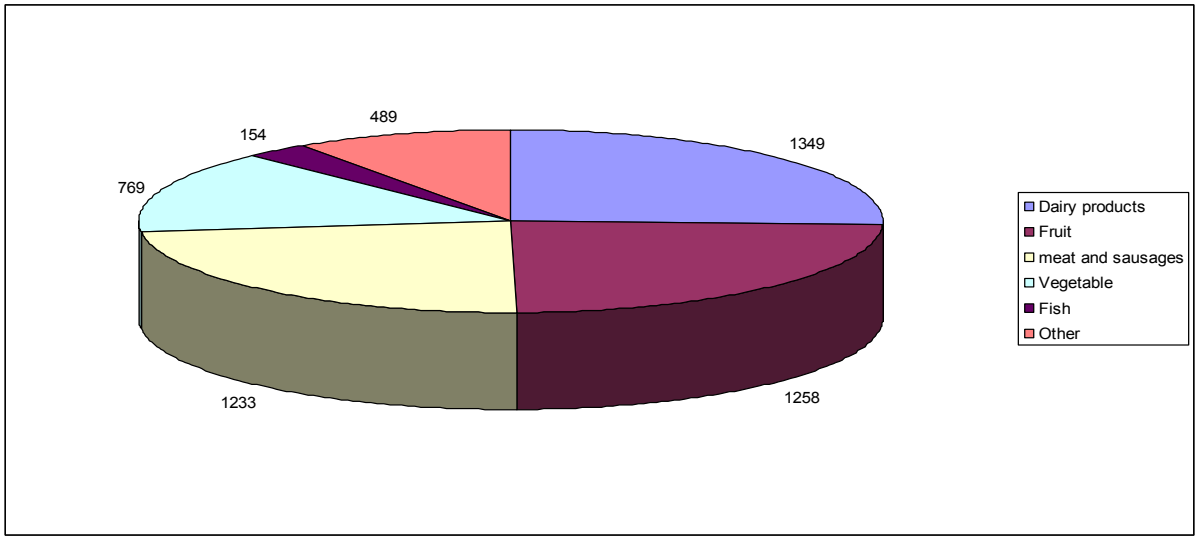
Figure 2: EU goods banned by Russian Federation in EU 28 (m EUR)



Source: The Russian Embargo: Impact on the Economic and Employment Situation in the EU, European Union available doi: 10.2861/73051 (paper)

In the short term, economic damage was most severe in the perishable products sector as harvest was ongoing for many fruits and vegetables when the Russian food ban entered into force.

6. Impact of sanctions on food products supply and agricultural policy in Russia

Impact of sanctions on the food products supply in Russia may be monitored according to the price changing. Average grow of prices on import banned food products in the internal Russian market was 116% for 2014 in comparing with 2013, 114% for 2015 in comparing with 2014 and 132% for 2015 in comparing with 2013. While inflation rate in Russia was 11,36% and 12,91% for 2014 and 2015 years.

For 2014 year of sanctions prices on pork and chicken meat rose on 27% in the internal Russian market, they were items with the biggest price changing. Prices on fish, apples and cheese rose on 22%, 21% and 19%. After the second wave of sanctions items with the biggest price changing became sunflower oil (with rising on 38%), frozen fish (25%), salted, marinated, smoked fish (21%) and meet of cattle (16%), see table 5.

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Table 5: Changing of average prices on some food products in Russia for 2013-2015 (at the end of year, in roubles for kilo)

Product name	2013	2014	Growth 2014/2013	2015	Growth 2015/2014	Growth 2015/2013
Meet of cattle (except boneless meat)	244,55	272,28	111%	314,94	116%	129%
Pork (except boneless meat)	214,18	272,36	127%	271,08	100%	127%
Chicken cooled or frozen	107,03	136,14	127%	133,73	98%	125%
Cooked sausage	302,94	310,54	103%	344,81	111%	114%
Fish frozen	90,79	110,65	122%	138,16	125%	152%
Fish salted, marinated, smoked	252,52	292,21	116%	352,58	121%	140%
Butter	308,92	357,54	116%	397,75	111%	129%
Sunflower oil	75,47	78,09	103%	107,62	138%	143%
Milk 2,5-3,2% fat, for a liter	38,64	43,81	113%	47,61	109%	123%
Cheese	326,89	388,81	119%	418,61	108%	128%
Apples	63,26	76,7	121%	87,43	114%	138%

Source: Federal State Statistics Service of Russia data, growth is calculated by authors.

As to the whole researching period at the end of 2015 in comparing with 2013 the most suffered for embargo production items became frozen fish (with rising of the price on 52%), sunflower oil (on 43%), salted, marinated, smoked fish (on 40%), apples (on 38%), butter and meet of cattle (on 29%).

With the aim to cover banned directions Russia starts or expands collaboration with other partners of the world. European meet on the Russian market is changing on it from Brazil, Belorussia, Paraguay, Argentina and Iran etc. European fruits - on them from Ecuador, Pakistan, Morocco, China etc. European vegetables - on them from Egypt, Republic of South Africa, Israel, Azerbaijan etc.

On the other hand there is a large changing in the internal agricultural policy of the Russian Federation. Internal policy of import substitution starts to grow. In the 19-th of December 2014 Government of the Russian Federation increased on 39% expenditures of federal budget on realization of agricultural development program till 2020. The sum was risen from 1,5 trillion rubles in 2012 till 2,1 trillion rubles in 2014.

Before sanctions period main objectives of Russian agricultural development were defined in the Food Security Doctrine of the Russian Federation (2010). Share of Russian agricultural raw materials and food products in total volume of these products on internal market were: [10]

- grain - not less than 95%,
- sugar - not less than 80%,
- vegetable oil - not less than 80%,
- meat and meat products - not less than 85%,
- milk and milk products - not less than 90%,
- fish products - not less than 80%,
- potato - not less than 95%,
- salt - not less than 85%.

But in his annual presidential address to the Federal Assembly of the Russian Federation on the 3-rd of December 2015 V.V. Putin initiated a challenges to provide totally internal market

by Russian agricultural raw materials and food products to 2020 and to move out to external markets with high quality natural products.

He said, that the Government has to support successful farmers and agricultural companies, first of all. All non-cultivated agricultural lands will be withdrawn and sold at auctions. Leading research institutes, the Russian Academy of Science must create Russian technologies of cultivating, storage and treatment of agricultural products.

This focus on internal resources of agricultural development means broad federal support of agriculture. As a result Russia will become really strong supplier of agricultural and food products on the world market in the nearest future.

7. Conclusion.

There is a big regrouping of food products trade flows in the world as a result of European-Russian mutual sanctions of 2014-2016. Both sides must spend a lot of resources to cover lack of demand on agricultural production in case of Europe and lack of agricultural raw materials and food products supply in case of Russia.

Almost two years on, it is clear that the EU agri-food sector has been remarkably resilient. In most regions, most of the affected sectors have been able to find alternative markets, either within the EU or beyond. Whereas Russia accounted for 10% of EU agri-food exports in 2013 (and the products banned amounted to 4 %), the value of overall exports have increased by 5 % from August 2014 to May 2015, compared to the same period of the previous year.

For the Russian side sanctions leaded to the price increasing. Average grow of prices on import banned food products in the internal Russian market was 132% for 2015 in comparing with 2013. While inflation rate in Russia was 11,36% and 12,91% for 2014 and 2015 years. Besides looking for new agricultural production supplies embargo on import from Europe became one of the driving forces for intensification of governmental support for agriculture.

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Application of net present value by the land purchase

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Abstract
In Slovakia most of the agricultural companies operate on the leased land (approximately 85 % from total land area). The agricultural companies can not only lease the land but also purchase it and operate on it. Through net present value we quantify whether it is worth for the agricultural companies in each Counties of Slovakia to lease the land and based on which conditions. Net present value belongs to the basic indicators of investment decision. By its calculation it is important to define the capital expenditure as well the calculation of expected financial incomes. The investment is viable if the indicator reaches the positive values. By the land lease the indicator NPV reaches negative values in all Counties of Slovakia. We modelled the capital expenditure (official land price) and financial incomes (land rent) by which NPV would reach minimal positive values. From the calculation of NPV results that the official price should be much lower to reach the minimal positive values of NPV.

Key words: *farms, land, land lease, land purchase, net present value*

JEL classification: *M21, Q15, Q24*

1. Introduction

Land market in Slovakia meets with lot of practical problems including fragmentation of land ownership and not completed land consolidation. The official price according to BSEU (bonity soil ecologic unit) ranges from 1.000 to 4.000 €/ha. The real market prices are between mentioned ranges (Hlaváčová, 2014). As long as the land market in Slovakia is not completely developed and land market prices introduced, the officially assigned land prices are practically in use. At the present time, land prices should express the supply prices, which cover the income effect of the land site under the socially necessary costs. The official prices are used for fiscal purposes and the land property rights (Bradáčová, 2007). In Slovakia there are used two types of the prices to evaluate the land price and it is official and market price. In the most productive areas the market prices are similar with the official land prices. The land prices are several times higher on the outskirts of towns and cities. In Slovakia does not exist consistent rule which would establish uniform price level of the agricultural land (Miklovičová & Miklovičová, 2015). Most of the farms operate on the leased land in Slovakia. The agricultural land is leased by the owners who do not operate on it or cannot and by the Slovak land fund (Buday, Grausová & Rybár, 2013). Land is a key factor in production agriculture and the land rental market tis an important institution in agriculture (Koirala, Mishra & Mohanty, 2016). Land ownership positively predicts a focus on longer-term economic and social goals, as well as pro-environmental attitudes. Land ownership negatively predicts short-term profitability goal focus, which in turn mediates the use of futures/options to maximize profit and influences land use for cash crops (Arora, Bert, Podesta & Krantz (2015). Operating on the own land is important stabilization factor of the business especially

for the family-type farms. In the last years we can follow gradual decline of leased land share in holdings of legal and natural persons (Buday, Chrastinová & Grausová, 2013). The leased contracts for agribusiness and cooperatives are concluded for period of 5 to 20 years. By the entrance to the new programming period it would be ideal if the leased and ownership relations to the land would stabilize until 2020 (Gondová, 2014). Rental price increased about 2,2 % from January 2014 while the law does not set an upper limit. For the farmers it is preferable to lease the land from the Slovak land fund due to the fact that the rental prices are lower than current market prices. Rental price is a question of bilateral contractual relations. In the productive areas the land rental ranges from 70 to 120 €/ha. The rental prices increase in the last period (Puškáč, 2013). Expenses linked with the rent of agricultural land reached approximately 3.1 % in 2014, what is opposite situation as by the legal entities. From this fact we can deduce that a significant portion of self-employed farmers operate on the own land in Slovakia (Chrastinová & Belešová, 2015). Agricultural land is the subject of the offer and demand. Its specific is limited area, no relocation and uniqueness of land. Agricultural land is the production factor and the market of agricultural land in the Czech Republic is relatively well developed. The development of the market price and the amount of the land lease for the agricultural land shows increasing trend. The lease costs of agriculture land per hectare increased up to 2013 twice in comparison with agriculture land price. This growth is only partly related to new owner's obligation to pay land tax for land parcels recorded in a digitized cadastre (Hruška & Vilhelm, 2015). In the Slovakia the number of sold parcels of agricultural land increased 10 times since 2001, from the value of 1 976 in 2001 to 20 411 in 2014. The highest number of land was sold in the year 2014. The area of sold parcels also had growing trend in the entire period Development of the average market price of agricultural land had variable character. The average market price had the minimum value in 2001 ant it was 0.19 €/m^2. It reached the level of 2001 with the value of 0.20 €/m^{2}againt in the year 2014 (Buday, Grausová & Buday, 2015).

After the accession to the European Union, the Slovak agriculture entered the large European market. In agriculture, however, apart from the standard market factors or the "invisible hand of the market", an important role is played also by the regulation of the branch by means of the Common Agricultural Policy of the EU and the regulating instruments of the industry management, implemented in the Slovak Republic by the Ministry of Land Economy and Rural development (Szabo & Grznár, 2015). Farm investments in the European Union are supported by the governmental programmes. Kirchweger, Kantelhardt & Leisch (2015) find that the supported investments cause an increase in farm growth with regard to the total and rented utilized agricultural area. Discounted cash flow analysis, including net present value is an established way to value land use and management investments which accounts for the time-value of money. However, it provides a static view and assumes passive commitment to an investment strategy when real world land use and management investment decisions are characterised by uncertainty, irreversibility, change and adaptation (Regan, Bryan, Connor, Meyer, Ostendorf, Zhu & Bao, 2016).

2. Data and methods

Basis for the article preparation were data provided by VUEPP Bratislava. The area of Slovakia is divided based on the natural conditions on the Counties which operate in the better natural conditions (they are located on the southern part of Slovakia and are low landed) and to these Counties belong Bratislava, Trnava and Nitra. Other Counties are situated in the worst natural conditions (mainly northern part of Slovakia) and it is Banská Bystrica, Trenčín, Žilina, Prešov and Košice. By the calculation of NPV we took into account two indicators which create NPV and it is cash income and capital expenses. The capital expenses consist

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from the expenses which are linked with the investment purchase – in our case with land. Cash incomes are all incomes which we expect or come from the investment. Their quantification is quite difficult because lot of factors impacted including the time factor. By the land lease we consider the official land price as the capital expenditure and the rent from land as the cash income. We expect the cash incomes for longer time period and we have to discount it. For interest rate we selected the interest rates from the long-term bank loans. The investment is feasible if the NPV reaches positive values.

$$\text{Net present value} = \frac{\sum Cash\ incomes}{(1+ir)^n} - capital\ expense \qquad (1)$$

3. Results and Discussion

In individual Counties of Slovakia the official land price ranges on different level. The highest official price is 2 349 €/ha in Trnava County, subsequently 2 241 €/ha in Nitra County and 2 025 €/ha in Bratislava County. All these Counties are located in lowland and they belong to the productive areas. Other Counties operate in the less favoured areas and the official price is significantly lower. From these Counties the Trenčín County has the highest official price 935 €/ha and the lowest price is in Žilina County in amount of 385 €/ha. From the point of view of the land lease the highest price for land lease is in the Counties situated in productive areas and ranges from 30 to 35 €/ha and in the Counties situated in the less favoured areas the land lease ranges from 6 to 14 €/ha. The amount of the official price and land lease in €/ha are shown in the table 1.

Table 1: Official price in €/ha and the rental price in €/ha in Counties of SR

Indicator/County	BA	TT	NR	TN	ZA	BB	PO	KE
Official price	2 025	2 349	2 241	935	385	643	521	896
Rent	30	35	34	14	6	10	8	13

Source: VUEPP BA

Based on these data we quantified the indicator NPV. The results of the calculation are shown in the table 2. NPV reaches negative values i.e. lower than zero what means that the investment is not profitable. In our case it is not profitable to lease the land by the land rental and official price. The worst values are in BA, TT and TN Counties where NPV reaches negative values higher than -1.700 €.

Table 2: Calculation of NPV

County/ir	5,91 %	4,69 %	5,82 %	5,69 %	5,83 %	5,59 %
BA	-1 803	-1 790	-1 802	-1 801	-1 802	-1 800
TT	-2 090	-2 075	-2 089	-2 088	-2 089	-2 086
NR	832	-825	-831	-830	-831	-830
TN	-1 990	-1 974	-1 989	-1 987	-1 989	-1 986
ZA	-341	-338	-340	-340	-340	-340
BB	-569	-565	-569	-568	-569	-568
PO	-462	-458	-462	-461	-462	-461
KE	-800	-794	-799	-799	-800	-798

Source: own calculation

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Based on the unfavourable results of NPV indicator, we model the amount of land lease by different interest rates to reach the minimal positive values of NPV. In table 3 there is shown the rental price by which it would be favourable to lease the land. From the results we can see that the price of land lease should be much higher than initial one. The land lease in Bratislava Country is on the level of 30 €/ha. Based on the results of minimal positive NPV the price of land lease should range by different interest rates from 259 to 274 €/ha. The price of land lease should by 9 times higher. In Trnava County the land lease is 35 €/ha, modelled land lease should be higher also around 9 times higher it means from 300 to 317 €/ha by settled interest rates to reach the minimal positive NPV. In Nitra County the price of land lease is 34 €/ha, modelled land lease should be 4 times higher and the price of land lease by the interest rates should range from 120 to 127 €/ha to reach minimal positive NPV. Counties in less favoured areas have lower price of land lease as the Counties in productive areas. In Trenčín County the price of land lease is 14 €/ha. This price of land lease is lower around 20 times in comparison with the modelled price of land lease. In Žilina County the price of land lease is 6 €/ha and the price of land lease should be from 50 to 52 €/ha to reach minimal positive NPV. In Banská Bystrica County the price of land lease is 10 €/ha and the modelled price of land lease shall be approximately 83 – 87 €/ha i.e. the price of land lease shall be around 8-9 times higher. In Prešov County the price of land lease is 8 €/ha and modelled price of land lease shall be from 67 to 71 €/ha to reach minimal positive NPV. In Košice County the price of land is 13 €/ha and this price shall be 115 – 121 €/ha to reach minimal positive NPV.

Table 3: Modelled rental price in €/ha by different interest rates by minimal positive NPV

County/ir	5,91 %	4,69 %	5,82 %	5,69 %	5,83 %	5,59 %
BA	274	259	273	272	273	270
TT	317	300	317	315	317	313
NR	126	120	126	126	127	125
TN	302	286	302	301	303	299
ZA	52	50	52	52	52	52
BB	87	83	87	87	87	86
PO	71	67	71	70	71	70
KE	121	115	121	120	121	120

Source: Own calculation

In the previous table we modelled the price of land lease i.e. the cash income by fixed capital expense and we calculated the minimal positive NPV. In table 4 there is quantified the capital expense i.e. modelled official price in €/ha in that way to reach minimal positive NPV. As we can see from the table the official prices should by much lower to be profitable to lease the land. The highest modelled official price is in Trnava County where the initial official price is 2.349 €/ha and the new official price should be in range from 258 to 274 €/ha i.e. minimal 9 times lower. In Bratislava County the official price is 2.025 €/ha and the new official price should be lower in range from 221 to 235 €/ha to reach the minimal positive NPV. In Nitra County the modelled official price should be 21 times lower on the level 103 – 109 €/ha in comparison with the initial official price. In Trenčín County the official price is the highest among the Counties situated in the less favoured areas. It is in amount of 935 €/ha and the modelled price should be 4 times lower. In Žilina County is the lowest official price 385 €/ha and the modelled official price should be 8 times lower i.e. 44 – 47 €/ha. In Banská Bystrica the official price is 643 €/ha and the modelled price is in range from 73 – 78 €/ha. In Prešov

County the official price is in amount of 521 €/ha, modelled official price should be lower on the level 59 – 62 €/ha i.e. lower around 8 times. In Košice County the official price is in amount of 896 €/ha, modelled official price should range from 96 to 101 €/ha to reach minimal positive value of NPV i.e. it should be 9 times lower.

Table 4: Modelled official price in €/ha

County/ir	5,91 %	4,69 %	5,82 %	5,69 %	5,83 %	5,59 %
BA	221	235	222	224	222	225
TT	258	274	259	261	259	262
NR	103	109	103	104	103	105
TN	251	266	252	253	252	255
ZA	44	47	44	44	44	45
BB	73	78	74	74	74	75
PO	59	62	59	59	59	60
KE	96	101	96	97	96	97

Source: own calculation

4. Conclusion

The agricultural companies can lease or purchase the land. In the paper we quantified through the net present value if it is profitable to lease the land. The net present value by the land lease reached negative values by chosen interest rates in all Counties of Slovakia i.e. lower than zero what means that it is not profitable to lease the land by the official price and price of land lease. The most unfavourable values were reached in Bratislava, Trnava and Trenčín County. By modelling of the price of land lease i.e. cash income and reaching the minimal positive net present value, the price of land lease should be much higher than it is. By modelling of the official price i.e. capital expense and fixed price of land lease, the official price should by much lower than it is in each County of Slovakia to reach minimal positive values.

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Cost management strategy for energy use in agriculture: EU sample

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Abstract
Efficiency analysis is useful for all kinds of production. Outputs and inputs can be optimized by this analysis. In this way costs are also minimized. Many inputs are used in agriculture production and only purpose is to produce more. In agricultural production there are desirable and undesirable outputs. The amount of emissions comes from fossil fuels is an undesirable output. We must maximize the desirable outputs and minimize the undesirable outputs. Also, we need to minimize the inputs to minimize the costs. In this study, Data Envelopment Analysis and partial efficiency analysis was applied to determine the cost management. Two outputs and four inputs were detemined for the measurement of the cost efficiency. According to analysis, it is determined that, the EU countries must protect the capital stock optimization and decrease the energy usage about 29.81%, land usage about 64.80% and employment in agriculture about 35.62%.

Keywords: *Cost Management, Cost Effciency, Sustainable Agriculture, Environment, EU*

JEL Classification: *D24, D61, Q15, Q52*

1. Introduction

Agricultural production has always been there since the beginning of humanity. Today, industry and services sectors may seem like surpassed the agricultural sector, but it's a fact that the importance of sustainable agriculture is increasing. Many inputs are used in agriculture production and only purpose is to produce more. There are many components of sustainable agriculture. The nvironment and energy use are just some of them. However, the economy should also be included as a separate component. Is it? Like any production, agricultural production also has a cost. We need agricultural production, because we need food to live. In order to produce more, how much we need to spend more?

The greatest danger to the environment arises from the use of fossil fuels. Fossil fuels are used in many areas of agricultural production. Also a large portion of the pollution caused by agriculture, stems from fossil fuels. Here we encounter three questions. How much we spend? How much we produce? How much we pollute? After these questions, the fourth and more important question may be asked. Can we produce the same, by polluting less and spending less? Efficiency analysis can answer this question.

This study is about partial energy efficiency in agriculture. So we can determine the sufficient amount of usage. On the other hand, we will compare the production value of agricultural, pollution comes from the consumption of the fossil fuels in agriculture, employment in agriculture, capital stock in agriculture and energy use in agriculture as cost efficiency. Thus, we think we will get the answers to our questions.

2. Data and Methods

In this study, 28 countries of the EU were determined as decision making units (DMU). Cost efficiency scores were determined by output oriented Data Envelopment Analysis (DEA)

model under the assumption of constant returns to scale. All data were obtained from the Food and Agriculture Organization (FAO) for the year 2012. Missing data were estimated based on historical data.

2.1 Data Set

In the production process, there are desirable and undesirable outputs. This also applies to agricultural production. In this study, we determined two outputs and four inputs:

Outputs:

- Gross production value for agricultural production (million $)
- Amount of emissions for agriculture caused by fossil fuells (CO_2 equivalent) (gigagrams): Includes, gas-diesel oil, motor gasoline, natural gas, liquefied petroleum gas, fuel oil and coal)

Inputs:

- Energy usage share (Energy use in agriculture / Total energy use)
- Land share (Agricultural area / Total land)
- Gross capital stock (million $) (2005 constant): Includes, land development, livestock (fixed assets), livestock (inventory), machinery and equipments, plantation crops, structures for livestock. The sum was included in the analysis.
- Employment in agriculture (1000 people)

2.2 Methods

Partial efficiency was used in order to estimate the energy efficiency of EU countries. Partial efficiency is a simple ratio of a single output and a single input (Ozden and Dios-Palomares, 2015).

Output oriented DEA model was used in order to estimate cost efficiency scores. After the introduction of the DEA model by Farrel (1957), Charnes, Cooper and Rhodes (1978) were designed CCR for efficiency estimation. CCR model is based on assumptions of Constant Returns to Scale (CRS). Detailed description about this model can be seen in many literatures (Ozden and Armagan, 2005; Martic et al., 2015; Ozden, 2010; Cooper et al., 2011; Ozden and Dios-Palomares, 2015; Ozden, 2016). The purpose of this model is to maximize the output without changing the amount of inputs. But we have desirable and undesirable outputs. When we include both of them, model tries to maximize both of them. So if we want to analyze both desirable and undesirable outputs we need to maximize the desirable and minimize the undesirable output. There are several models for this situation. But these models are not suitable for basic softwares. Therefore a new simple index was designed to analyze the desirable and undesirable outputs together by Ozden (2016). When we change the place of the numerator and denominator the problem will be solved. So we include the undesirable output for analysis as *undesirable output* $^{-1}$. In this case when the model tries to maximize the undesirable output, undesirable output will be minimized. In this study the undesirable output is the amount of emissions for agriculture caused by fossil fuells (CO_2) (Ozden, 2016). And we include the undesirable output for analysis as $1/CO_2$.

3. Results and Discussion

In this study, we determined two outputs and four inputs to estimate the efficiency scores. Descriptive statistics for all variables can be seen in Table 1.

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Table 1: Descriptive Statistics

	Production Value	Emissions	Energy Share	Land Share	Capital Stock	Employment
Mean	13846.46	2387.16	2.46	43.06	24973.65	381.61
Minimum	146.21	21.14	0.31	7.47	98.49	1.80
Maximum	74289.12	12648.04	5.51	70.95	96594.46	2556.70
Std. Dev.	18683.03	3344.18	1.37	17.70	30405.61	588.60

Primarily, we must calculate the partial energy efficiencies for desirable and undesirable outputs. Gross production value OF agriculture is a desirable output and the amount of emissions from agriculture (CO_2 eq) is an undesirable output. Partial energy efficiency for desirable output is a simple ratio of energy use in agriculture and gross production value of agriculture. Partial energy efficiency for undesirable output is also a simple ratio of energy use in agriculture and the amount of emissions from agriculture . Thus, we can determine the energy efficient countries in EU. As seen in Table 2, the most efficient country for desirable output is Germany and UK following it. The most inefficient countries are, respectively, Cyprus, Latvia and Malta. Energy efficient countries for undesirable output are Luxembourg, and Malta respectively. And the inefficient ones are Netherlands, Poland and France (Table 3). These scores are not relative efficiency scores, they are countries own efficiencies.

Table 2: Partial Energy Efficiency in Agriculture (Production Value as Output)

Austria	0.039	**Germany**	1.268	**Lithuania**	0.013	**Slovenia**	0.006
Bulgaria	0.022	**Greece**	0.037	**Malta**	0.005	**Slovakia**	0.018
Cyprus	0.003	**Hungary**	0.031	**Netherlands**	0.021	**Spain**	0.150
Denmark	0.022	**Croatia**	0.005	**Czech Republic**	0.029	**Sweden**	0.021
Estonia	0.003	**Ireland**	0.029	**Poland**	0.041	**United Kingdom**	0.455
Finland	0.011	**Italy**	0.174	**Portugal**	0.035	**Belgium**	0.036
France	0.338	**Latvia**	0.004	**Romania**	0.103	**Luxembourg**	0.004

Table 3: Partial Energy Efficiency in Agriculture (CO_2 equivalent as Output)

Austria	0.056	**Germany**	0.031	**Lithuania**	0.197	**Slovenia**	0.268
Bulgaria	0.090	**Greece**	0.147	**Malta**	1.528	**Slovakia**	0.251
Cyprus	0.527	**Hungary**	0.039	**Netherlands**	0.002	**Spain**	0.005
Denmark	0.011	**Croatia**	0.037	**Czech Republic**	0.038	**Sweden**	0.084
Estonia	0.096	**Ireland**	0.060	**Poland**	0.003	**United Kingdom**	0.124
Finland	0.020	**Italy**	0.005	**Portugal**	0.048	**Belgium**	0.023
France	0.004	**Latvia**	0.074	**Romania**	0.047	**Luxembourg**	2.081

The next step is, to calculate the percentage of energy use in agriculture of total energy use. Here, a different partial energy index has been introduced for the countries. In terms of energy use in agriculture, it will not wrong to say that the countries with a low percentage, are more efficient. As seen in Table 4, Germany and Malta are the most efficient countries and Poland and Netherlands are the most inefficient countries.

Table 4: Partial Energy Efficiency in Agriculture (%) (Energy Use)

Austria	2.020	**Germany**	0.450	**Lithuania**	2.010	**Slovenia**	1.570
Bulgaria	2.040	**Greece**	4.240	**Malta**	0.310	**Slovakia**	1.190
Cyprus	2.140	**Hungary**	2.490	**Netherlands**	5.410	**Spain**	2.750
Denmark	4.980	**Croatia**	3.590	**Czech Republic**	1.980	**Sweden**	2.130
Estonia	3.350	**Ireland**	2.470	**Poland**	5.510	**United Kingdom**	0.640
Finland	3.310	**Italy**	2.440	**Portugal**	1.860	**Belgium**	2.070
France	2.200	**Latvia**	3.360	**Romania**	1.600	**Luxembourg**	0.790

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On the basis of three calculated partial efficiency scores, the most efficient countries in terms of energy use are, Germany and Malta and the most inefficient ones are Poland and the Netherlands. After the partial energy efficiency estimation the next step is the estimation of cost efficiency with desirable and undesirable outputs.

When we consider the results of cost efficiency estimation, the reference countries are Germany, Malta and Belgium. It means, these countries are determined as full efficient. And Poland is again determined as the most inefficient country. The mean of cost efficiency scores are "0.653" (Table 5).

Table 5: Cost Efficiency Estimates for Agricultural Production

Austria	0.603	**Germany**	1.000	**Lithuania**	0.314	**Slovenia**	0.345
Bulgaria	0.686	**Greece**	0.808	**Malta**	1.000	**Slovakia**	0.361
Cyprus	0.723	**Hungary**	0.699	**Netherlands**	0.950	**Spain**	0.637
Denmark	0.885	**Croatia**	0.818	**Czech Republic**	0.527	**Sweden**	0.597
Estonia	0.407	**Ireland**	0.653	**Poland**	0.304	**United Kingdom**	0.869
Finland	0.408	**Italy**	0.675	**Portugal**	0.527	**Belgium**	1.000
France	0.954	**Latvia**	0.351	**Romania**	0.490	**Luxembourg**	0.706

Finally, the last step is the determination of improvements for inputs and outputs. Improvements are given for each input, output and country. Improvements for outputs shows us the percentage that how much we can increase our production, without changing the amount of inputs. As previously mentioned, we take the output, amount of emissions from agriculture (CO_2 eq), as $1/CO_2$. So it means that, how much we can decrease the amount of emissions from agriculture without changing the amount of inputs. As a result, in EU, we can increase the gross production value for agriculture 73.42 % and we can decrease the amount of emissions from agriculture 84.30%. The striking result is about Bulgaria. Bulgaria can decrease its emission release 229.40% without changing the amount of inputs (Table 6, Table 7).

Table 6: Improvements for Gross Production Value

Austria	65.90	**Germany**	0.00	**Lithuania**	218.70	**Slovenia**	190.20
Bulgaria	45.70	**Greece**	23.80	**Malta**	0.00	**Slovakia**	176.90
Cyprus	38.30	**Hungary**	43.00	**Netherlands**	5.30	**Spain**	57.00
Denmark	11.25	**Croatia**	22.20	**Czech Republic**	89.60	**Sweden**	67.50
Estonia	145.90	**Ireland**	53.10	**Poland**	167.40	**United Kingdom**	15.10
Finland	144.90	**Italy**	48.10	**Portugal**	89.90	**Belgium**	0.00
France	4.78	**Latvia**	185.20	**Romania**	104.20	**Luxembourg**	41.70

Table 7: Improvements for Amount of Emissions From Agriculture

Austria	64.92	**Germany**	0.00	**Lithuania**	218.70	**Slovenia**	192.54
Bulgaria	229.40	**Greece**	20.80	**Malta**	0.00	**Slovakia**	166.41
Cyprus	33.40	**Hungary**	43.54	**Netherlands**	57.60	**Spain**	57.00
Denmark	22.15	**Croatia**	109.10	**Czech Republic**	99.60	**Sweden**	47.50
Estonia	181.50	**Ireland**	51.17	**Poland**	161.40	**United Kingdom**	12.10
Finland	141.70	**Italy**	42.30	**Portugal**	82.40	**Belgium**	0.00
France	14.18	**Latvia**	165.10	**Romania**	114.27	**Luxembourg**	31.70

In EU, countires can decrease their energy usage share about 29.81% on avarage. Germany, Malta, Denmark, France, Hungary, Ireland, Czech Republic, Romania, Slovakia, UK and Belgiumhave the optimum share of energy usage (Table 8).

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Table 8: Improvements for Energy Usage Share

Austria	-22.80	**Germany**	0,00	**Lithuania**	-11,40	**Slovenia**	-51,50
Bulgaria	-8.30	**Greece**	-35,40	**Malta**	0,00	**Slovakia**	0,00
Cyprus	-90.40	**Hungary**	0,00	**Netherlands**	-51,50	**Spain**	-14,90
Denmark	0.00	**Croatia**	-80,00	**Czech Republic**	0,00	**Sweden**	-88,50
Estonia	-78.00	**Ireland**	0,00	**Poland**	-63,00	**United Kingdom**	0,00
Finland	-91.70	**Italy**	-19,10	**Portugal**	-3,00	**Belgium**	0,00
France	0.00	**Latvia**	-64,40	**Romania**	0,00	**Luxembourg**	-60,70

Except Hungary, Ireland, Czech Republic, Romania, Slovakia, UK and Luxembourg, all the other countries have the optimum land sahare for agricultural production. Luxemburg must decrease the share of land usage about 64.80% (Table 9).

Table 9: Improvements for Land Share

Austria	0.00	**Germany**	0.00	**Lithuania**	0.00	**Slovenia**	0.00
Bulgaria	0.00	**Greece**	0.00	**Malta**	0.00	**Slovakia**	-25.50
Cyprus	0.00	**Hungary**	-8.80	**Netherlands**	0.00	**Spain**	0.00
Denmark	0.00	**Croatia**	0.00	**Czech Republic**	-21.20	**Sweden**	0.00
Estonia	0.00	**Ireland**	-18.60	**Poland**	0.00	**United Kingdom**	-12.50
Finland	0.00	**Italy**	0.00	**Portugal**	0.00	**Belgium**	0.00
France	0.00	**Latvia**	0.00	**Romania**	-38.30	**Luxembourg**	-64.80

Improvements about gross capital stock shows that, only five countries must decrease their investments. These countries are, Ireland, Sweden, Luxembourg, Finland and UK. It is not wrong to say that, EU is on the right way for investments (Table 10).

Table 10: Improvements for Gross Capital Stock

Austria	0.00	**Germany**	0.00	**Lithuania**	0.00	**Slovenia**	0.00
Bulgaria	0.00	**Greece**	0.00	**Malta**	0.00	**Slovakia**	0.00
Cyprus	0.00	**Hungary**	0.00	**Netherlands**	0.00	**Spain**	0.00
Denmark	0.00	**Croatia**	0.00	**Czech Republic**	0.00	**Sweden**	-31.20
Estonia	0.00	**Ireland**	-44.00	**Poland**	0.00	**United Kingdom**	-6.70
Finland	-7.30	**Italy**	0.00	**Portugal**	0.00	**Belgium**	0.00
France	0.00	**Latvia**	0.00	**Romania**	0.00	**Luxembourg**	-8.40

If EU decrease the employment in agriculture about35.62%, there will be no change in outputs. Especially in Romania, Portugal, Bulgaria and Slovenia agricultural workers should be directed to other sectors (Table 11).

Table 11: Improvements for Employment in Agriculture

Austria	-38.10	**Germany**	0.00	**Lithuania**	-39.60	**Slovenia**	-71.10
Bulgaria	-75.60	**Greece**	-64.10	**Malta**	0.00	**Slovakia**	-36.00
Cyprus	-14.20	**Hungary**	-55.00	**Netherlands**	-54.20	**Spain**	-12.90
Denmark	7.20	**Croatia**	-91.40	**Czech Republic**	-39.40	**Sweden**	-19.40
Estonia	-37.30	**Ireland**	0.00	**Poland**	-69.00	**United Kingdom**	0.00
Finland	-11.90	**Italy**	-23.90	**Portugal**	-78.00	**Belgium**	0.00
France	5.12	**Latvia**	-58.40	**Romania**	-87.00	**Luxembourg**	0.00

4. Conclusions

In order to produce more, how much we need to spend more? This is the question for cost management. We can decrease the amount of inputs in order to produce the same amount of outputs. This is the aim of efficiency analysis.

According to partial energy efficiencies for EU countries, the scores are quite low. This means, countries can decrease their energy usage in agricultural production. Energy is an expensive input. It affects both costs and environment. In order to minimize the costs and environmental damage, cost efficiency was calculated for EU countries. If we need to minimize the cost, we must decrease the amount of inputs.

According to the analysis, it does not seem to have any problems in terms of agricultural investments. So in the EU countries capital stock optimization must be protected. Ratio of the the energy used in agriculture and total energy consumption is an indicator for energy usage. This rate can be reduced by a third. This will also reduce the costs. Likewise, also the land share and employment can be reduced. These can only be achieved with long-term policies.

When we reduce the energy consumption in agriculture, we can produce the same with less cost and environmental damage.

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The problems of winemaking in Poland: a case study of winemakers on the Małopolska Wine Route

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Abstract
Wine production and consumption in Poland is located in a niche area, but along with social and economic changes. Polish wine market became one of the most dynamically growing in Europe, similar to local wine production. Developing wine manufacturing branch in the suitable regions, might be a chance for diversification of activities of the farms, strengthening agritourist offer and developing the trails of thematic tourism in Poland and contribute to a cultural change in a model of alcohol consumption in Poland. The aim of the paper was to identify the main problems hindering a development of this new branch of agricultural production activity, in a context of human depending phenomena. The research method based on fieldwork, observation in vineyards and winery and focus group interviews and a questionnaire conducted with owners of wineries and wine producers from Malopolska region. Those let us identify the areas of subjectively perceived problems of winemakers and formulate the weaknesses that may have a negative impact for development of this fledgling sector. The main problems reported by manufacturers in a questionnaire were related to legal and institutional issues of winemakers in Poland, also there was pointed a question of an access to relevant plant protection products in a context of possibility of carrying organic farming and a problem of certification. The focus group interview, revealed some internal problems of Polish winemaking, connected with social and human capital and lack of sufficiently coherent vision of development of the Polish wine manufacturing sector.

Key words: *Polish Wine, Malopolska Wine, winemaking, wine region*

JEl Classification: *Q10*

Introduction

The history of Polish winemaking dates back to the early Middle Ages, as is confirmed by archeobotanical findings made in Cracow. Seeds of *vitis vinifera* dating from the IX-Xth century have been found on the slopes of Wawel Hill (Muller-Bieniek, 2012, p. 85.). The cultivation of vineyards and winemaking developed after the adoption of Christianity, along with growing needs for altar wine. In and around medieval Cracow, vineyards were cultivated by monks from the Benedictine Abby in Tyniec and the Norbertine Order on Saint Bronislawa Hill. The seeds of a vine from the later Middle Ages period have also been found in the area of the Main Square (Muller-Bieniek, 2012, p. 85). The Małopolska region was the first location for wine cultivation in Poland. Although, in the Subcarpathian region, traces of vine cultivation have been found dating back to the XIth century, it was along the Vistula river in towns like Sandomierz, Toruń or Płock (Włodarczyk, 2008), on the western border of today's Poland in Zielona Góra from the XIIth century (Kuleba, 2013) and from the XIIIth century in Western Pomerania in the Szczecin area (Rzeszotarska-Pałka, 2012). Political, natural and social changes, that started already in the XVIIth century, led to the disappearance of the tradition of winemaking and wine drinking. The end of XXth century has brought a return of wine to Polish tables and the planting of vines in Poland.

Wine consumption in Poland is considered one of the lowest in Europe, but at the same time it is growing very dynamically, and the speed of growth of the wine market over the period

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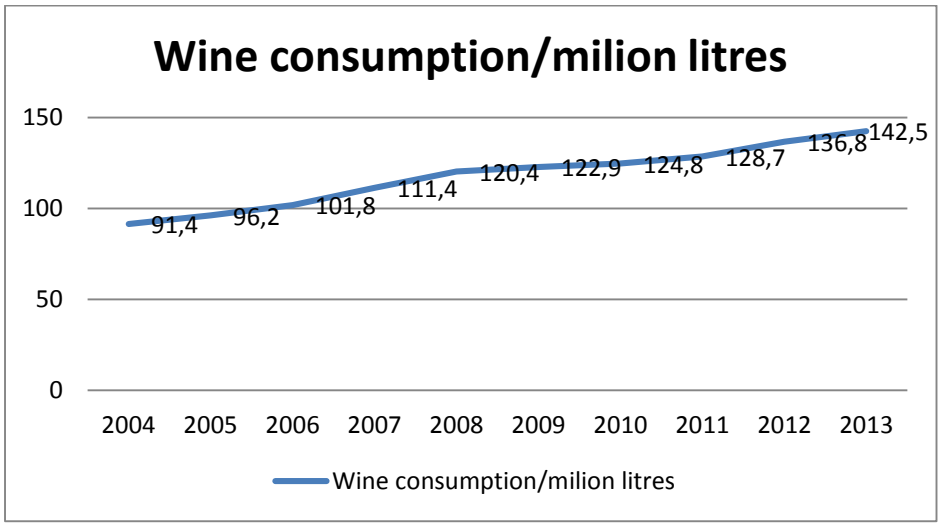
2005-2015 amounted to 51.7%, whereas the rate of growth was 30.3% for vodka and 38.9% for beer (Ambra, 2015). Wine has become the third category of alcohol consumed in Poland, accounting for 7.4% of the alcohol market, after beer (34.6%) and vodka (51.1%) (Ambra, 2015). According to a research study conducted by KPMG (2014), 35% of adult people in Poland have consumed wine within the last month and 76% within the last year. In the period 2004-2013, a significant increase was reported in the level of consumption and the amount of money[1] spent on wine, as is presented in graph 1.

Graph 1: Wine consumption in Poland, 2004-2014



Source: KPMG Report, *Rynek napojów alkoholowych w Polsce*. 2014.

The growing interest in wine also manifests itself in an increase in the popularity of vine cultivation and wine production. This phenomena started in 1980s and became particularly dynamic at the beginning of XXIst century. It is difficult to indicate an accurate number of vineyards in Poland, as the majority of them are not officially registered entities, used for production for the owners' own needs. However, according data from the Agriculture Market Agency (ARR), there are around 700 vineyards, with 104 of these already officially registered and allowed to sell their product in the 2015/2016 season, proof that more and more winemakers in Poland are starting to treat this activity as a profession rather than just a hobby. Graph 2 presents the changes in the number of registered vineyards and in registered vineyard area.

[1] Wine expenditure in billions of PLN: 2004: 1.1; 2005: 1.2; 2006: 1.3; 2007: 1.4; 2008: 1.6; 2009: 1.7; 2010: 1.8; 2011: 2.1, 2012: 2.3; 2013: 2.8 (KPMG).

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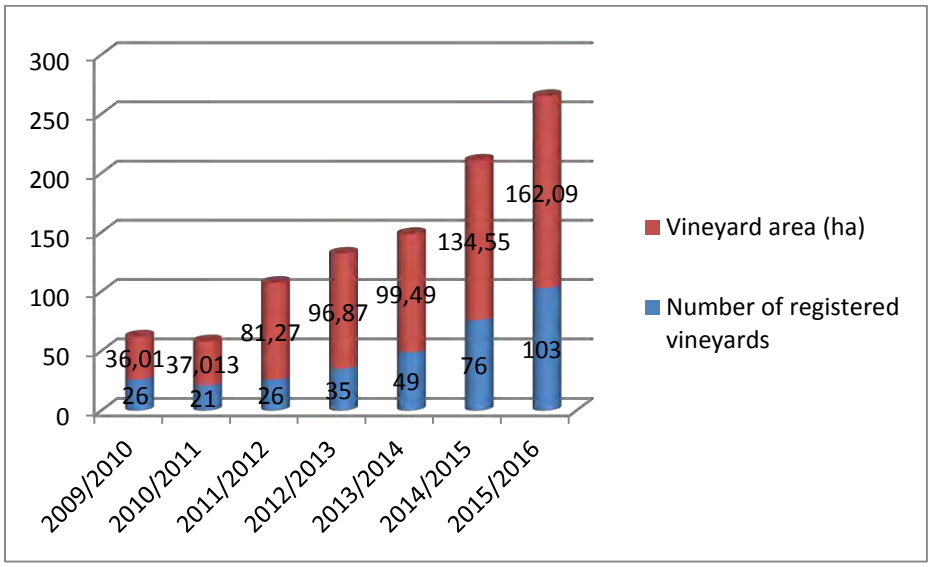
Graph 2: The number of registered vineyards and their area in Poland



Source: Agricultural Market Agency Report, *Rynek wina w liczbach*, 2016.

Polish winemaking is still a niche business, but it is indicative of global trends of thematic tourism, affects the maintenance of the landscape, offers an alternative path in agribusiness and answers growing wine demand in Poland. It is therefore worth specifying the areas in which problems are being encountered.

The scope and methodology of the research

This paper aims to define the main threats and weaknesses being reported by Polish winemakers, arising out of the institutional environment (this paper does not focus on problems arising from natural conditions). The geographical scope covers the winemakers of Małopolska, one of Poland's most significant wine regions[2], where there are over 60 vineyards (www.winogrodnicy.pl), 21 of which operate as part of the Małopolska Wine Trail (www.malopolskiszlakwinny.pl), from whose members a research sample was selected, using a snowball method (Voicu, Babonea, 2011). The research used a qualitative approach. In order to identify the problems winemakers are facing, individual in-depth interviews were conducted with 11 of the winemakers, based on a questionnaire containing closed and open questions, referring to the following subjects: 1) Vineyard data: a) Legal status (registered/non-registered) 2) Winemaker data: a) Education b) Cooperativeness 3) Issues addressed 4) Data irrelevant from the point of view of this paper. Each of the questions relating to the above subjects, also allowed some space for the winemaker to freely express their views on the issue discussed. All the interviews were conducted during the period from February 2015 to November 2015.

Findings

The interviews revealed a number of problems faced by winemakers and different approaches to winemaking and wine business. Table 1 contains a concise summary of the responses given. However, the main areas of problems highlighted relate to those that arise from the external environment and internal community of winemakers. Among the issues indicated

[2] Polish wine regions are focused in the south and west of the country: Zielona Góra region, Silesia region, Małopolska region, Subcarpathian region and Lesser Polish Gorge of the Vistula region.

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relating to the internal environment, the respondents identified problems referring to human and social capital such as: lack of in-depth knowledge and experience of winemakers, unwillingness to register activity, which can affect the quality of wine in Małopolska and have an impact on its image; and reluctance to cooperate. The interviews also revealed a certain dissonance between the winemakers from various subregions[3]. Among problems of an institutional nature, the most emphasized were: a lack of interest and support from the state and local governments; limited possibilities of obtaining financial support for vine growing and processing; a risk of excessive controls from various administrative entities; complicated administrative processes; insufficient availability of quality training; problems with access to organic / ecological plant protection products and limited availability of suitable conventional products of that kind, as well as the low level of activity of wine organizations.

The issues of human and social capital within the internal community of winemakers of the Małopolska region can be a potential obstacle to the development of a Polish wine industry. The significance of knowledge and its transfer is a crucial issue for the growth of this business. Małopolska winemakers are usually responsible for all levels of operations, from administrative issues, via gardening and plant maintenance, sales and marketing, to the winemaking process. That requires a wide knowledge. Although all interviewed winemakers declared a willingness to share their knowledge (two suggested it would be a paid service), the main problem is a lack of proper basics and education in the first place. Only one winery said that it employed a professional winemaker, one of the owners had an education in a related field, two people declared supplementary study or training[4]. The others were self-educated by "trial and error", often not having a vision of the effect that they would like to achieve. Human capital can, however, be increased by participation in a network, also one of the dimensions of social capital. The other issue is an institutional environment that is, according to the opinions of winemakers, is hindering development. The problem of social capital among Małopolska winemakers and an analysis of the institutional problems highlighted will be a subject for further consideration.

[3] Wine subregions of Małopolska focussed around Cracow and Tarnów.

[4] In Poland, the offer of oenological studies is limited. The Jagiellonian University in Cracow offers a year-long postgraduate training course, while the University of Agriculture in Cracow offers a 7-semester course of weekend studies in winemaking. The University of Wroclaw has prepared a postgraduate course, and a course in in winegrowing and winemaking is also available in Sulechów, as a specialization in gardening, and at the Podkarpacka Akademia Wina (a private entity).

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Table 1: Characteristics of legal status and human capital of Małopolska winemakers and the issues they identified

	Legal status	Education/knowledge	Other remarks
V1	R[5]	*Self-education *International and local training *Sharing knowledge	*Too few registered vineyards *Non-registered vineyards lowering the level of quality of Polish wine *Lack of wine culture in Poland *A need for a technological centre (preferably in Cracow) and a well-equipped laboratory available to all Małopolska winemakers *Low level of cooperativeness of Małopolska winemakers
V2	R	*Oenology studies	*Lack of biological/ecological plant protection products *Lack of knowledge and experience of winemakers *Low level of cooperation of winemakers *Lack of interest and support from the state *Limited possibilities of obtaining financial resources
V3	NR	*Self-education *Sharing knowledge *Local training	*Lack of biological/ecological plant protection products
V4	NR	*Chemistry degree *Self-education	*A fear of excessive control prevents winemaker from registration *Lack of interest and support from the state *Limited possibilities of obtaining financial resources * High administrative cost of registered production
V5	R	*Self-education *Sharing knowledge *Local training	*A fear of excessive control *Too complicated administrative process for legal wine sale *Low level of cooperativeness of Małopolska winemakers
V6	R	*Self-education *Sharing knowledge *Local training	*Lack of suitable selection of plant protection products *Lack of interest and support from the state
V7	NR	*Self-education *Sharing knowledge *Local training	*High administrative cost of registered production *Too complicated administrative process for legal wine production and sale *A fear of excessive control
V8	NR	*Self-education *Sharing knowledge *Local training	*High administrative cost of registered production *Too complicated administrative process for legal wine production and sale *A fear of excessive control
V9	R	*Postgraduate oenological course *Self-education *Sharing knowledge *Local training	*Polish winemaking is still in the learning phase, this results in errors being made by winemakers and stakeholders *There is no institution for certifying organic production of wine
V10	NR	*Self-education *Sharing knowledge *Local training	*Lack of a support from local government *Available training is poor *Winemakers from region of Tarnów and Kraków presenting different point of view for cooperation - lack of cooperation within the region * High administrative cost of registered production *Too complicated administrative process for legal wine production and sale
V11	NR	*Self-education *Sharing knowledge	*High administrative cost of registered production *Too complicated administrative process for legal wine production and sale

Source: own research (2015).

[5] R - Registered, with permission for sale. NR - Not registered, no ability to sell.

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Does Social Capital Matters for Winemaking?

Social capital can be defined as *features of social organizations, such as networks, norms and trust that facilitate action and cooperation for mutual benefit* (Putnam, 1993). Its significance has been the subject of extensive research, proving its influence on numerous phenomena relevant to the subjects discussed here, including its relations with education (Aldrige, 2002), community governance (Bowles, Gintis, 2002), cooperation within sectors (Brown, Asham 1996), regional development (Lyon, 2000), economic development, efficiency of institutions or stability of economic system and democracy (Fukuyama, 2001). Social capital is however a multidimensional phenomenon, based on trust, volunteerism, neighbourhood connections, everyday sociability, togetherness, generalized roles, group characteristics (number of members, frequency of participation, participation in decision-making, contribution of money, source of group funding, etc.) (Narayan, Cassidy, 2001). The significance of these phenomena was recognized by S. Cinotto in his book entitled *Soft Soil, Black Grapes: The Birth of Italian Winemaking in California*, where he writes about a successes of Italian winemakers in California, achieved also thanks to the social capital of strong community and participation of winemakers in their ethnic economy (Cinotto, 2012, p. 93-105). The significance of social capital for the winemaking industry was also confirmed in Okanagan, British Columbia, Canada (Hickton, 2004), where the government introduced a strategy to give support to quality winemaking[6], and social capital was put to use to enable this strategy to achieve optimum results; and in the Brazilian wine industry (Manke, Gennari, Faccin, 2012); and in the Transdanubia region of Hungary, where research came to the conclusion that a high level of trust and confidence facilitate the formation of intercompany relations, which in turn allows potential risk to be shared and makes problem-solving easier (Bányi, Józsa, 2015). Social capital was also positively correlated with length of residence in a wine tourism research study (Barbieri, Xu, Leung, 2014) and, as proven by Alonso and Bressan, small family wineries are themselves important contributors to social capital and socio-economic development (2013). The declarations made by Małopolska winemakers, due to the limited size of the sample, do not have the overall merit of statistic surveys. However, they do show a certain pattern within the region. Using the simplest typology of social capital: bonding (connecting closest groups, people with similar situation) vs bridging (linking different groups, can generate broader identities and reciprocity, may be more valuable from the point of view of socio-economic development) (Putnam, 2000, pp. 22-23), it is possible to note a certain advantage of bonding over bridging capital. All the winemakers were members of a formal project, however the project was created by an external entity and was not a common initiative[7]. 10 out of 11 declared they can rely on other winemakers from the region for

[6] Wine tradition in Okanagan region started in 1920. However, in 1981 there were still only 14 wineries, most with hybrid grapes, whereas, in 2002, there were already around 100. A strategic support plan was created by both the industry and government, the British Columbia Wine Institute being designed in part to remove labrusca and hybrid grape varieties and replant vineyards with *vitis vinifera*. *The Vintners Quality Alliance (VQA) program was developed in the early years of the British Columbia Wine Institute, in cooperation with the industry in Ontario, to provide standards for wine, certification criteria, and market development support for premium wines produced by participating wineries. The Okanagan Wine Festival Society was established twenty years ago by a group of wineries and tourism operators who believed in developing awareness of the young wineries at the time. The annual event has experienced tremendous success which has paralleled the growth of the wine industry. These three formal organizations are some of the more popular groups with a large membership base.* (Hickton, 2004).

[7] The following questions were asked to identify the level of social capital: 1) Do you belong to a formal organization/project unifying winemakers of the region? 2) Can you relay on informal support of the winemakers from a region? 3) Are you willing to share your knowledge and experience with other winemakers? Do you have a friendly relations with other winemakers from a region / country / abroad? 4) Defining a main goal of winemakers activity you see it as... 5) Do you expect regional winemakers to act together for one aim? 6) Have you acted together or do you have any plans to act together to achieve one common goal?

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informal support. 10 of 11 declared a will to share their knowledge and experience with their colleagues (two of them if it would be a paid service). All the winemakers maintained relations with some of their colleagues from within the region (10/11), the country (11/11) or abroad (4/11), and, regarding the significance of their relations with other winemakers, 10 out of 11 chose the option "we are acting for one common goal" (only one person chose the response "we are competitors"). Those answers show bonds within the group. What is however interesting is that non-registered winemakers tend to be more reliant on group support than registered ones. One of registered winemakers said in an interview: *Nobody really knows how their wine is made* (of not registered colleagues), *what they are adding...* another: *without registration, we cannot really begin to think about consistent quality of wine from a region.* Five producers admitted the existence of some confusion between winemakers from the Cracow and Tarnow regions. There are two dividing lines here - regional and legal. Nobody however described this situation as one of conflict, and one of the respondents declared: *Most people try to cooperate. We take part in conventions, and act democratically. We must act together, as we are all winemakers*. In contrast, bridging capital tends to be much weaker. Among the winemakers interviewed, nobody believed they can act together towards achieving one common aim, by establishing relations with external groups or entities. One of the winemakers said: *I don't like this idea of forming a lobby at all. This is something that should be done by individuals*. Another confirmed: *I don't want to take a part in anything like it* (acting for one common aim). *I just want to make wine.* Or: *There is no chance that people will act together. Maybe just a small group could be motivated enough to do so* and: *I think as winemakers, we do not actually have the same aims*. A passive attitude toward external entities was also present in the answers given to the question "Have you acted together or do you have any plans to act together to achieve one common goal?", there was no joint initiative or project. Only two respondents said that they had organized an educational project together. Diagnosing the social capital of the winemakers of the Małopolska Wine Trail, it can be seen that there is a certain feeling of helplessness with regard to external entities, expecting the initiative rather to be taken on their part. This is reflected in the main problem and issues the winemakers are facing: relations with controlling and supporting institutions, which will be discussed in the following part of this paper.

Institutional problems of winemaking

The institutional problems the winemakers are facing are perhaps often not being presented to the legislator, because of a lack of common initiative. At the same time, according to the winemakers, the legislator has a tendency to ignore this growing industry, due to its niche character, and does not try to meet its needs. There is a distinctive distance to power among the winemakers, as evidenced by following quotes: *The government doesn't care about the wine industry, only vodka is important... The only thing the government wants is to earn money from the wine sector. But it barely exists!...* or: *I don't want to register my activity - what for? To have constant inspections, extra cost of excise, VAT... I run an agritourism service*[8] *and so I don't need to worry about any of that...otherwise, I think I would have to have a customs warehouse...* and: *Listen! Do you know how many controlling bodies can come to check up on me if I'm a registered winemaker? Nine! Nine entities can control me!* This high distance to power results in a reluctance among winemakers to formalize their activity, which in turn has an effect on the general quality of the product, causes splits among winemakers, weakens the market power of the Małopolska wine industry and the development of the sector as a whole. However, the registered winemakers shared the opinion

[8] Majority of winemakers prefer to offer their product as a part of an agritourism service.

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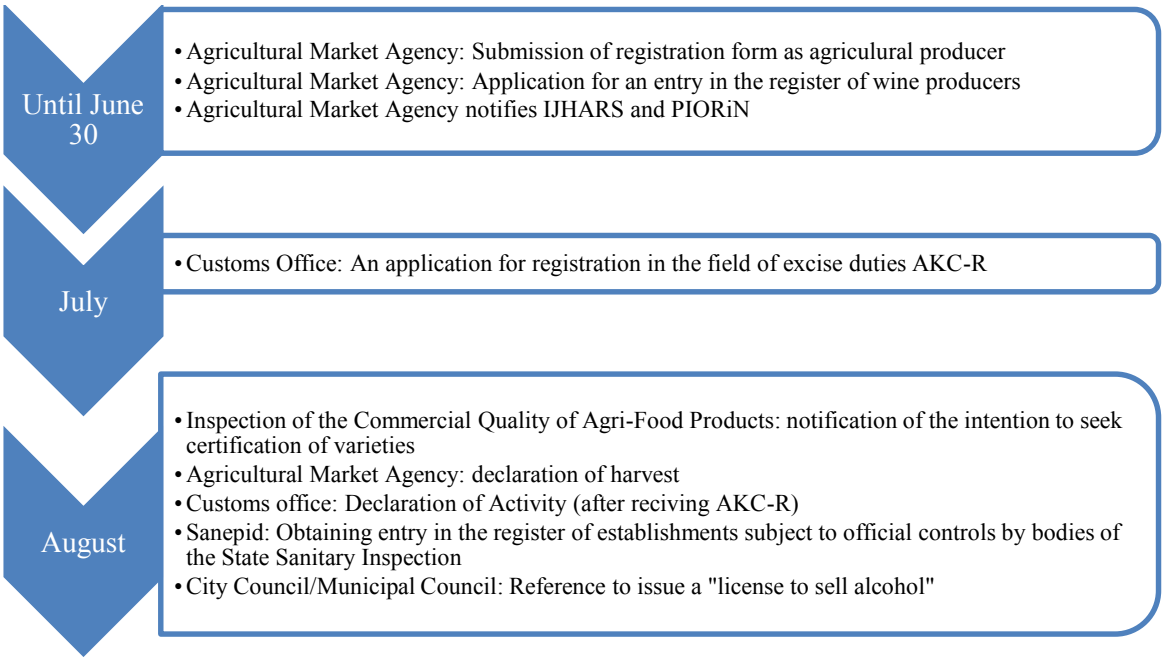
that though the number of possible controls is indeed high, in practice there are not many and that they are not too onerous: *I was worried about all those controls, but it's not too bad, so far... They threatened us with continuous controls. I had three this year...* In practice, there are five institutions with the power to control the winemaking process – the Customs Office, Tax Office, Agricultural Market Agency, IJHARS (Inspection of the Commercial Quality of Agri-Food Products), State Inspection for Plant and Seed Protection (PIORiN) and Sanepid (State Sanitary Inspectorate). However, each part of the production process may be subject to a control. The bureaucratic procedure of registration and controlled wine production is a highly formal process, including 9 stages in the annual production cycle, as presented in graph 3.

Graph 3: Process of registration for wine production and sale



Source: own study, based on (Rosół, 2014).

Moreover, winemakers are obliged to submit up to 6 declarations per year to the Agricultural Market Agency regarding planned harvest, production, and production and stocks from the previous year (*Ustawa z dnia 12 maja 2011, Dz. U. Nr 120, poz. 690*) and to develop and pursue in written form an internal control process covering: 1) the frequency and method of taking samples for quality tests; testing methods; methods of dealing with wines presenting substandard quality requirements 2) securing and disposal of waste generated during the wine-making process 3) keeping a record of wine input and output 4) reporting the intention to carry out oenological processes, i.e. enrichment, de-acidification or sweetening (*Obowiązki producenta*, IJHARS, 2015). The procedure is thus discouraging for many winemakers, not just because of the bureaucratic issues involved but also because of the cost of administrative procedures.

Another problem highlighted concerned the co-financing of the wine business. The winegrowers only had access to a basic subsidy and then only for the farms bigger than 1 ha. The two first editions of the PROW (Rural Development Program) overlooked the phenomenon of Polish winemaking. During the period 2007-2013, winemakers could apply for funds for modernization of a farm. But only the 2014-2020 edition of the program is supposed to give winemakers access to realistic support, recognizing their real production profile and offering a range of tools for the farms not bigger then 300ha. The aid is planned in the form of the reimbursement of a portion of eligible costs (up to 50% or 60% in the case of

collective investment or investment by young farmers) and not less than 30% of eligible costs. There are also plans for the possibility for young farmers, under 40 years old, to take a part in a program, which also extends to winegrowers. Support can also be sought for winemaking under the sub-initiative "Processing and marketing of agricultural products". Lastly, the project for PROW 2014-2020 also provides support for cooperation between farmers, up to an amount of 15,000,000 PLN (KRiR, 2014)[9].

Conclusion

The Małopolska winemaking industry is still a niche activity. However, the growth in wine consumption, coupled with the increasing popularity of Slow Food and Local Food movements, means the prospects for winemaking in Poland are interesting. The main obstacles highlighted by the winemakers concern the institutional environment and the low level of support given by the government to this particular activity. A short analysis of administrative registration process and the bureaucratic obligations of winegrowers and wine producers confirm those remarks. The number of controlling institutions and levels of control bid the question of the relationship of trust between the state and manufacturers. Also omitting winegrowers and winemakers in two first editions of the PROW Rural Development Program did not help to build a relationship of trust between the state and wine manufacturers. A low level of bridging social capital, another issue raised by winemakers, tends to be related with such institutional problems. The developing wine culture in Poland, which is important from the point of view of social change, the tourism industry, diversification of agricultural activity and market trends, needs real support from government, support of the kind that will let the fledgling sector become competitive on the global market in the future, instead of leaving Polish winemaking neglected to remain a hobby activity treated as a curiosity. To achieve this goal, the winemakers, who are the founders of the industry as it is today, need to be more unified and cooperate more strongly together.

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Management of human resources in agricultural sector enterprises

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Abstract
Staff - human resources are indispensable for the success of any organization, they represent a priority source of effective action and prosperity of the business. Purposeful creation and use of human potential is a prerequisite for building up and developing the strengths and competitive advantages of the enterprise. The primary objective of the paper is to assess the level of work with human resources in the selected file of enterprises in agricultural sector of SR.

Key words: *human resources, the human potential, personnel work, company, organization, the employee, employer*

JEL Classification: *M540, J430*

1. Introduction

Management of human resources can be understood as an activity, where the focus is on the staff of the organization, so on the human resources, which, together with the other features of the holistic management contributes to the achievement of synergic effect- fulfilment of the objectives of the staff and the organization as a whole.

To this activity, managers and employees of the personnel departments as well, are involved, whose job is to improve the work with the people in organization and to provide advice and services to the line managers and also to an employees.

The dynamics of economic development require that the management of human resources, encourage a strategic approach. From this it can be derived the specific definition of the management of human resources: "Human Resources Management represents a strategic and coherent logical approach to work with the people in organization, who are individually and collectively involved in the effective implementation of the goals of organization."

The global aim of the management of human resources is to achieve a competitive advantage through strategic distribution of capable and dedicated to the organization employees by using an integrated system of cultural personnel procedures.

Management of human resources is such an approach to personnel management, which there are line managers as well as HR professionals involved in. This approach, among other things, emphasizes the importance of human resources more than an asset (capital) of the organization and the costs of the organization per the employee.

In each of the schools of management it is attributed to the man, as the production factor, different weight. In principle, it is true, that in the historical development of the science of management a man gradually becomes a decisive factor of the success and a prerequisite of the strategic advantage of the organization. To this knowledge, according to Armstrong, M. (2007) the following scientific schools or movements contributed:

– School of human relations, represented by Mayo, which emphasized the social needs of the people and claimed that the productivity directly depends on the job satisfaction.

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- Behavioural Science movement, represented by Maslow, Argyris, Herzberg and Likert, who highlighted that the means of ensuring higher employee motivation and achieving better results is increasing the quality of working life.
- The organizational development movement was represented by Bennis, Schein and Beckhard, who focused on the overall effectiveness of the organization and, in particular, how people behave in situations in which they consistently interact.
- School of excellence, was represented by Pascal and Athos as well as Peters and Waterman, who have drawn up a list of attributes that characterize successful organizations, while underlining the need for a strong organizational culture and connectedness of employees with the organization.

The importance of the quality of human resources for the success of organizations in the future highlights Kassay (2001), who in the book "A world class Enterprise" says: ... "for a company that wants to keep ahead of the market, it is necessary to draw their attention to their intangible capital, to the assets tied up in human resources. For their purpose there are many theories and perspectives, but all originate and end in human resources – their skills, flexibility, communication, education, creative thinking and improving the environment, in clearly set the corporate culture and employee behaviour ".

Historically, the oldest understood view of work with people in organizations is, as a service providing in the first place the administrative work and procedures associated with employing people. Such a concept attributed an utterly passive role to the personnel work and it is known in later development as „personnel administration".

Later, the active role of personal work began to promote, as a true personnel management. Personnel services of new type began to form, that shaped the personnel policy and developed methods of personal work. However, little attention has been devoted to the long-term strategic issues of working with people.

In recent years, therefore, also in our country it began to take shape of the current concept of the work with people as, "human resources management", which became the core of the management. This new position to work with people, highlights the importance of a man for the success of the organization. Human resources management already includes not only the strategic aspects, but also the orientation on external factors of shaping and the use of people in the organization such as: population development, labour market, value orientation, and social conditions.

2. Data and Methods

The aim of the paper is to assess the management of human resources in enterprises of agriculture sector and consequently the proposal of the measures to improve the work with the human resources.

The object of the investigation were 59 businesses of agriculture sector, of which 30 are enterprises of the food industry and 29 are enterprises of agricultural primary products. All the examined subjects were in terms of the size, included in the category of small and medium-sized enterprises.

In order to obtain primary data was used the technique of questionnaire survey. A substantial part of the questionnaire consisted of semi closed questions so that each respondent had the option to choose from the offered alternatives and also could express their opinion, or could add a suggestion or recommendation. Due to the fact that the survey was provided by personal

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contact with the managers of the company, the return of the questionnaire was 98.3%. The time horizon of the investigation was 2014-2015.

3. Results and Discussion

Exploration of the management of human resources in enterprises of agricultural sector clearly showed that the level of work with human resources in each of the companies is very diverse. In the category of small enterprises, which accounted for a total of 64% of the samples examined, no one had created a human resources department or the report. Work with human resources ensures mostly the business economist.

In businesses, which has been entrusted the economic agenda to the external firm, a solution to the personnel matters are within the scope of the work of the senior manager, which has been in almost all cases, the owner of the business.

All medium-sized enterprises has created a report of a personnel work, represented by one manager, who was hierarchically directly subordinated to the senior manager.

In attaining the employees, substantial part of the examined business primarily oriented on the internal resources, because they didn't have an interest in raising the number of employees. Less than 40% of the subjects in the reporting period used also the external sources, especially advertising and recommendation by the tribal employees. Only four companies have adopted new employees from among the fresh graduates of educational institutions.

In the selection process a substantial proportion of respondents – almost 80% would prefer the method of selection interview.

Very diverse results have been achieved in the field of training and development of employees. Respondents in all surveyed enterprises clearly confirmed the high degree of responsibility for the implementation of educational activities imposed by law. From other areas of the education they payed closest attention to current news and information from the field of legislation, scientific and technological development and ICT.

A remarkable and highly positive was also a finding that nearly a third of the enterprises in the reporting period ensured training aimed on improving social skills for their managers and employees. Less positive was the fact that, with the requirement of the implementation of education, most of the enterprises did not apply for a reputable educational institutions types as the universities and colleges, but they let themselves lured by the attractive web-pages of the different agencies, the level of which was often questionable.

All the examined business acknowledge a high degree of importance to the evaluation of the employees. In the evaluation criteria, the most commonly was used measure of performance in the category of most performing employees and scale or scoring methods for managers. For extremely important, in terms of motivation almost all respondents have identified the direct link of evaluation with reward.

4. Conclusion

In the system of work with human resources in our organizations there is a necessary transition from a paradigm of things shift to the paradigm of people. The main reason for the change in approach to the work with human resources, is the need to release their potential (especially creative, motivational, and integrative-regulatory) for the implementation of positive change in organization.

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If we accept the paradigm of people, so we realize that to lead people does not mean command, prohibit, but to create the conditions for the development of employees and to use their human capital for the benefit of the organization. This means, that we need to get them for the cooperation. To get people to cooperation, there are a number of strategies. In essence, however, they can be divided into two groups:

- **The manipulation**

The repertoire of manipulation includes not only handling orders and commands, but also: intimidation, suspect, tricks, using promises and threats to force and the allowing to get under the pressure. Under the influence of the manipulation, people allow it, however, they remain internally on the opposite side. This is reflected negatively in the efficiency of their work and especially in low initiative. The consequences of manipulations are a misunderstandings, conflicts, disputes, that lead to long term stress, tension and low use of potential. In an effort to defend their position the formal authority use manipulation. But there is such a truth that, *we can buy the hand of man, but we can't buy his heart and just there his enthusiasm and loyalty is hidden. We can buy the backbone of human beings, but we can't buy his brain and just there his creativity is hidden.*

- **The real achievement of the cooperation**

It is a nonviolent form and by this an effective way. While in manipulation the power and force is applied, in achievement it is respect – respect for human beings. The employee is willing to cooperate if he feels a positive relationship to him, if we take him as a valuable human-personality. If we explain him purpose of cooperation logically and clearly and if he does not feel manipulation, then he will be open to cooperation.

Getting to the cooperation, however, must respect the diversity of people, or the type of the working groups.

Especially challenging is to get to cooperate and keep highly qualified people (professionals) who do not want to be managed, because they can act independently, responsibly and with knowledge of the matter.

Such people include, in particular, researchers, universities and staff excellent specialists.

Professionals can be influence by the acts rather than words. Therefore the question of the fundamental values of managers are important for them.

After the motives and the key values they are interested in competence of the manager. It is required by the leader to have constructive new ideas how to improve things. If the above conditions are met, the highly qualified people (professionals) are willing to report high performance, since in this group high performance is not only a question of intelligence and knowledge, but also a matter of the heart.

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State support of dairy farming in the Vologda region of Russia

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Abstract
Milk and dairy products are traditional in food ration of Russian people. At the same time in many districts of the country the volume level of average per capita milk consumption stays lower than the dietary intake. Due to this fact there is an objective necessity for milk production scale-up.
Agrarian production is apriority-oriented, socially important and dynamically developing sector of the Vologda region economics. Products of milk processing are the brand of the region. That is why the government of the Vologda region pays special attention to the branch of dairy farming. The article presents the study results of influence of different forms of state support of milk production in agricultural enterprises of the Vologda region on performance indicators of their business activities. The trends in volume dynamics of state assistance and its results have been found out.

Key words: *state support, dairy farming, milk production, prime cost, profit, profitability*

JEL Classification: *Q01, Q1, Q18*

1. Introduction

The necessity of the state support of agriculture is defined by its sectoral characteristics. Providing subsidies for agricultural enterprises is mainly aimed at the elimination of inequivalent commodity exchange between economic sectors, maintenance of effectualagricultural production in general.

Milk and dairy products traditionally take up one of the leading positions in food ration of Russian citizens. According to the data of Ministry of Agriculture of the Russian Federation, the volume of milk production in agricultural enterprises in 2014 increased in 2,6 % up to 16,3 million tons [4]. However, with the growth of milk production dairy products consumption by the population doesn't reach dietary intakes.

The state support has provided for positive dynamics of milk raw materials in Russia for the recent years, but in 2014 deficit of raw milk in Russia remained and was 7,2 million tons [5]. Current situation influences negatively on usage of productive capacity of processing enterprises - dairy plants, therefore, on the level of dairy products consumption by the population. Sustainable development of agriculture is the basis of food safety of the country, stabilization of food market in Russia and substantial decrease of agricultural import.

Over the last years,some measures to create the complex system of the state support of agriculture in the regions have been taken in Russia, funding of the sector from the federal and regional budget has increased. Since the Vologda region is one of the most significant regions for milk and dairy products production in Russia, it is necessary to evaluate the measures taken by the state, to make the obtained results clear and analyze the efficiency of the state support ofdairy farming in the Vologda region.

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2. Data and Methods

The Vologda region belongs to the number of regions which are large enough in territory in the European North of Russia. Having 0,6% of agricultural lands of the Russian Federation, the Vologda region produces 0,8% of all the agricultural products of the country [1].

Agriculture refers to priority-oriented economic sectors of the Vologda region. In spite of the fact that the region is located in the area of risk farming, it is rightly considered to be agricultural: annually agricultural production is produced here amounting to more than 20 milliard rubles. The main suppliers of agricultural production on the market of the Vologda region are agricultural organizations. They produce 72% of the total volume of agricultural production of the region.

Dairy farming is the main sector of agriculture of the Vologda region. Profits from sales of animal products take the biggest relatives hare in income of agricultural enterprises – 91 % (among them from milk sales – 50 %) [1].

Unfortunately, for the recent years negative processes can be seen. During the last 10 years productive livestock population has reduced in 30 % in the Vologda region (table 1). In 2014 cattle population was only 69,8% from the level of year 2005 and cows population - 69,7%.

Table 1: Cattle and cows population in enterprises of all categories of the Vologda region on January, the 1st, thousands animal units

Line item	Years										Rateofgrowth, %
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Cattle population											
Enterprises of all categories	233,1	230,3	226,4	215,3	204,5	196,7	184,9	179,0	166,7	162,6	69,8
Including:											
Agricultural organizations	196,8	193,8	194,7	186,8	176,2	171,2	161,6	157,5	146,5	142,6	72,5
Including cows population											
Enterprises of all categories	109,2	105,4	103,7	99,9	93,6	90,9	86,6	83,0	76,2	76,1	69,7
Including:											
Agricultural organizations	91,9	89,3	89,7	87,4	81,9	80,3	77,0	74,3	68,2	68,0	73,9

Source: Calculated by authors based on official Internet-portal of Vologdastat. «Statistical Yearbook of the Vologda region in figures 2014». Retrieved from: http://vologdastat.ru/bgd/cifrfakt/Isswww.exe/Stg/2014/i720104r.htm

The main cause of livestock reduction was the high price of credit resources and insufficient state support in terms of subsidies for compensation of interest rate. In 2009 milk producers were forced to send "for meat" about six and half thousand milk cows in order to pay back their credits [1].

At the same time agricultural enterprises increased the usage rate of livestock population. In 2014 milk yield per cow amounted to 6025 kilograms, that is 13,3% above the average in Russia (drawing 1).

Nowadays in Russia and in the Vologda region the shortage of milk and dairy products consumption can be seen. In the Vologda region in 2014, according to the data of the Federal service of state statistics

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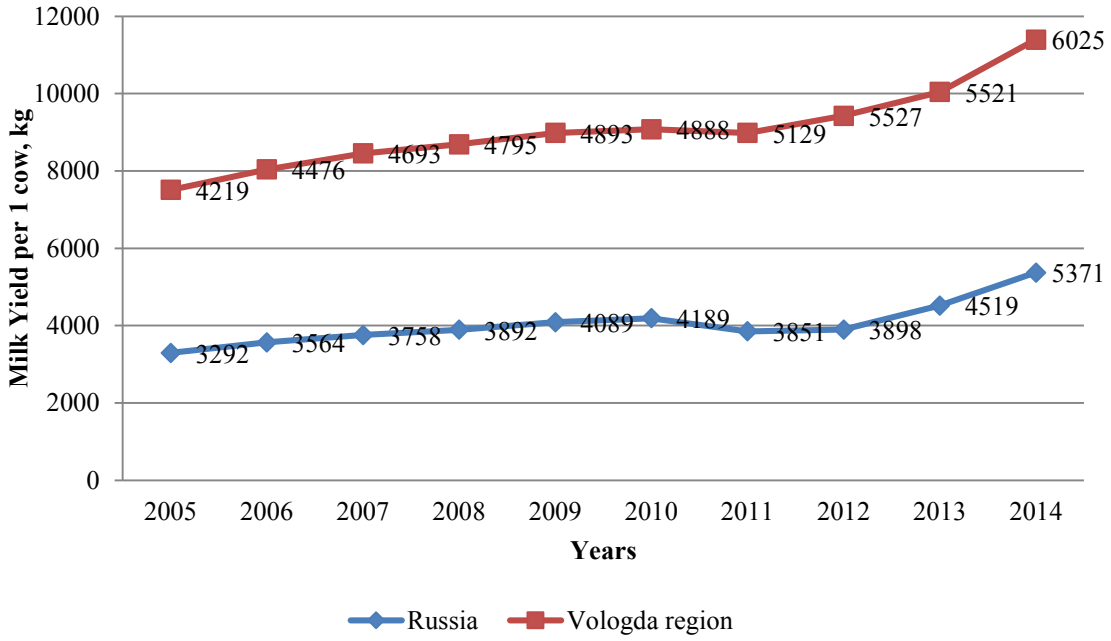
yearly consumption of dairy products calculated as milk totaled 239 kilos per capita at the physiological rate of 392 kilos [7].

The main reason of such situation is the reduction of volume of milk production because of cows' population reduction, excess of milk and dairy products export over import in two times in the region, that infringes the food safety of the region.

Drawing 1: Milk cow productivity in Russia in the Vologda region for the period 2005 -2014



Source: Official Internet portal of Vologdastat. «Statistical Yearbook of the Vologda region in figures 2014».Retrieved from: http://vologdastat.ru/bgd/cifrfakt/Isswww.exe/Stg/2014/i720104r.htm

Agriculture of the Vologda region develops in conditions of insufficient financial resources. To a large extent it is defined by a low level of direct state support. If in 1990 70% ofinvestment costs were compensated out of the funds of budget of agricultural enterprises then in 2014 – only 2% [8].

The influence of financial and economic crisis unfavorably implied on the situation with the agricultural sector. The situation on the inner market of dairy products didn't work out in favor of agricultural enterprises because the prime cost of milk production was 75-83 % of sales price [7].

Insufficient attention of the state to the problems of market regulation and support of agriculture led to extensivedisparity of prices, earnings dilution and loss development of agricultural production. According to the data of the Federal service of state statistics for year 2014 prices in the region increased comparing with the previous year: for electricity - in 7,7%, gas - 13,8%, diesel fuel - 2%, feed-stuff- 12,5%. At the same time, prices for agricultural products increased only in 3,8%, for milk - 14,3% [3].

Increase in productivity of cows and milk production, reduction of labor input for production couldn't overcome disparity of prices on feed-stuff market, diesel fuel and energetics and etc., share of costs for which made from 56 to 65,8% in expenses for milk production in agricultural enterprises [2]. That's why the prime cost of products in enterprises of the Vologda region increases constantly (drawing 2).

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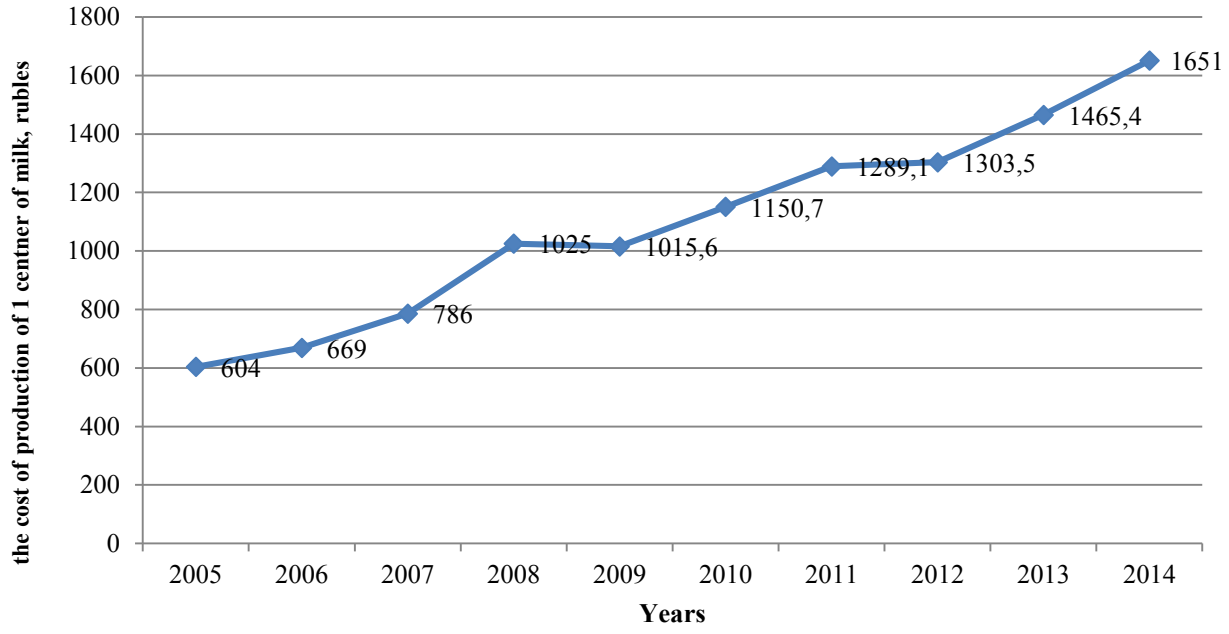
Drawing 2: Dynamics of the prime cost level of milk in agricultural organizations of the Vologda region, rubles/1 centner



Source: Calculated by authors based on official Internet-portal of Vologdastat. «StatisticalYearbookof the Vologdaregioninfigures 2014». Retrieved from: http://vologdastat.ru/bgd/cifrfakt/Isswww.exe/Stg/2014/i720104r.htm

Taking into account the role of agriculture in social and economic system of the country and particularity of its functioning, it's necessary to admit that the sector is in need of regulation and support from the state more than many other sectors of the national economy that is reasonably caused by the current level of sector development, by its low investment potential, risky nature of running entrepreneurship.

3. Results and Discussion

For the purposes offinancial support the state compensates a part of operating and investment costs of agricultural enterprises. However, first of all the volume of budgetary support stays low. The fact that only 0,6% of GDP is given for agriculture in Russia, when 1,3% - in the USA and 2,8% - in EU testifies this. Secondly, the main part of the budgetary funds for the recent years has been directed to the compensation of a part of costs to pay credit interest rate; that is not for developing the production but for creating market infrastructure, which is connected with financial institutions [9]. Therefore, the measures of economic stabilization and development of agricultural sector in Russia influence its condition slightly.

At the moment the state support of production of agricultural products in Russia is realized in accordance with the State program of agricultural development and regulation of markets of agricultural products, raw materials and provisions for 2013 -2020. The program allows providing subsidies from the federal budget to regions in many directions, one of which is support of dairy farming.

The regional program of the state support has been accepted in the Vologda region. In 2014 additional resources for amount of 500 million rubles were given from the regional budget to support agriculture in order to provide food safety in the region and because of the risk of foreign policy caused by the food embargo. Therefore, in 2013-2014 the volume of the state support for the agricultural sector in the region,

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taking into account resources form the federal budget, made 2,6 milliard rubles annually (table 2). Budgetary costs for supporting livestock farming made 31,7% of all costs of the program in 2013 and 26,9% in 2014 (table 2).

Table 2: State support of agriculture in the Vologda region in 2013-2014, million rubles

Line item	2013			2014		
	Total from the budget	Including		Total from the budget	Including	
		Federal budget	Regional budget		Federal budget	Regional budget
Total according to the program including:	2628,1	1636,0	992,1	2628,0	1046,6	1595,4
1. Development of live stock farming, including:	834,2	666,8	167,4	707,8	360,8	347,0
- Development of breeding livestock farming	102,1	88,2	13,9	129,3	84,1	45,2
- Development of milk livestock farming, including:	641,6	543,3	98,3	631,7	275,7	356,0
- Subsidies for 1 kg of sold milk	-	-	-	366,5	275,7	90,8
- Subsidies for growth of livestock population	-	-	-	108,2	-	108,2
- Subsidies for reimbursement of expenses on purchase of livestock	-	-	-	7,0	-	7,0
2. Development of family livestock farms	38,0	18,0	20,0	37,5	17,4	20,1
3. Support of farmers-newcomers	20,0	11,1	9,0	25,7	15,1	10,6

Source: Calculated by the authors according to the Official website of the Department of agriculture and food resources of the Vologda region. Annual reports on the implementation of the State program «Development of agroindustrial complex and consumer market of the Vologda region for 2013-2020» for 2013 and 2014. Retrieved from: http://www.vologda-agro.ru/images/stories/Годовой_отчет_по_ГП.pdf.

The reason for reduction of expenses share for the state support of dairy farming was the decrease of subsidies given from the federal budget of the country. Comparing with 2013 significant changes of the structure of dairy farming funding can be seen in the growth of subsidies share from the regional budget from 15,3% in 2013 to 56,3% in 2014 году. That is, the regional budget has to bear the main responsibility in providing the state support for milk production (table 2).

In 2014 thank to implementation of new types of the state support from the regional budget – subsidies for growth of livestock population and for reimbursement of a part of expenses on purchase of cows by private farm holdings – it was possible to stabilize cow population in the Vologda region. As a result of taken measures total growth of milk production in the Vologda region made 14,4 thousand tons (103,3% to 2013), the average milk yield from one cow – 6028 kg (109,1% to 2013 г.), relative economic stabilization and increase of production of agricultural products were achieved [6].

The analysis of the state support efficiency of agricultural enterprises has shown that the increase of volume of budgetary expenses influenced positively on the situation in agriculture of the Vologda region.

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In 2014 by using the state subsidies it was possible to overcome the crises of 2012-2013, when the high price of credits and belated state support of enterprises led to reduction of livestock population, decrease in production of milk and other agricultural products.

Table 3: The analysis of the state support efficiency of agricultural enterprises of the Vologda region

Line item	Years					Changes for the period(+,-)
	2010	2011	2012	2013	2014	
Budgetary funds received by agricultural enterprises, million rubles	1474,2	1026,8	789,8	1678,8	1709,5	235,3
Profitability taking into account the state support, %	6,5	4,5	-0,2	-24,4	11,9	5,4
Level of the state support (relation of the sum of support to income), %	11,2	6,7	5,2	11,8	11,4	0,2
Index of budgetary efficiency (taxes payed for 1 ruble of the state support), rubles.	1,1	1,7	1,9	0,8	0,8	-0,3
Budgetary resources for 1 ton of milk, rubles	3328	2302	1836	3776	4216	888
Level of recovery of expenses on production of 1 ton of milk, %	28,9	17,9	14,8	25,8	25,5	-3,4

Source: Calculated by authors based on official Internet-portal of Vologdastat. «Statistical Yearbook of the Vologda region in figures 2014». Retrieved from: http://vologdastat.ru/bgd/cifrfakt/Isswww.exe/Stg/2014/i720104r.htm

The high value of budgetary efficiency in 2010-2012 tells about "pumpover" of financial resources from agricultural enterprises back to the budgetary system. For the recent years the situation has changed for the better. Also we can mention that the state takes measures to regulate the disparity of prices. In 2014 state subsidies compensated to agricultural enterprises 25 % of expenses for milk production. Taking into account the state support, which had been provided to agricultural enterprises, profitability of production increased (table 3).

According to preliminary evaluation of the Department of agriculture of the Vologda regionin 2015 the volume of production of agricultural products made 29, 0 milliard rubles, it was 2 % more than in the previous year. In spite of the positive tendencies in dairy farming the main tasks in the sector for 2016 - 2017 are further increasing the volumes of milk production, providing the population with safe and quality food products of own production, continuing the modernization of production [3].

4. Conclusion

According to the results of the study a conclusion can be done that current economic conditions of functioning of the dairy farming sector in the Vologda region, the volume of its state support do not provide the necessary level of the sector development. The solution of the problem of stabilization and development of the dairy farming sector has a complex nature and depends on the actions of government authorities of federal and regional levels in the sphere of regulation of milk production market.

The current situation in dairy farming of the Vologda region and in Russia in general is defined by created inequivalent relationship between sectoral markets, and an insufficient level of the state support. Development of scientific-methodical grounds of providing the state subsidies to agricultural enterprises would let increase the efficiency of usage of budgetary resources.

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SESSION 4

Entrepreneurship and corporate social responsibility

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Application of the Kaizen philosophy – a road to a learner business

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Abstract
The focus of the article is analysis of the Kaizen method and its application in various companies. The main philosophy of the Kaizen method is that each employee contributes to continuous incremental improvement of company's processes. It is a wholesome philosophy of management, which includes the entire company and places individuals in the middle of the action. The Kaizen method is not limited to production entities, but it needs to be focused on the company's vision. The method is an appropriate and a well used tool for identifying and analyzing problems related to productivity with management without a system, with low work productivity, with work safety, and others. The Kaizen method is a Japanese philosophy that focuses on continuous incremental improvement of all aspects of one's life. Kaizen is not a widely used method for improving quality in businesses. It can be applied in all branches of production since managers are not the only ones striving to improve production processes, production, and to improve the work place, but mainly employees are. It focuses not only on improving quality, but also on improving everything that can be improved within a company, because even a slight improvement affects the quality of production or services. However, it is not a method, but a process oriented way of thinking, which provides a basis for behaviors in ones daily life.

Key Words: *company, innovation, Kaizen, quality management, system, TQM*

JEL classification: *M21*

1. Introduction

Organizations and particularly production companies consider quality management to be a necessary part of company management. Quality management influences all processes in a company and an organization. The opening of the economy and markets in the 1990s brought to Slovakia foreign investment and allowed national producers to place their products on foreign markets. Foreign partners who were used to well established standards started to require of their Slovak partners that they adhere to the same standards of quality. Later on such systems were implemented in Slovak companies and organizations. Throughout the last years of the 20th century, the current practices in Slovakia have proven the necessity to implement quality systems into companies' activities and to do this from the companies' initiatives.

Influenced by foreign partners, Slovak companies implemented quality systems and adhered to the rules that stemmed from them. Quality management spread even more after Slovakia's entre into the European Union and then after the entry into the monetary union. By implementing quality systems, companies and organizations gained competitive advantage. As more companies implemented quality systems, we also saw establishment of companies providing quality audits. The Slovak Technical Norm – STN has a designation STN EN ISO. As quality is established in companies and organizations, we can see that within the scope of quality, it leads to competition. In 2000 the state decided to support implementation of quality management and established an annual competition, the National Prize for Quality. The competition has been taking place annually for the past 16 years. The competition aids in

developing a business environment in Slovakia. It promotes continuous improvement of quality in all activities, better results than competition, and maximum success in the marketplace. The Slovak Organization for Quality was established in 1993 as a professional association for quality. According to information about quality and acquired experiences, many companies were not satisfied with the established quality systems. As a result a shift to a higher level of quality management, to Total Quality Management (TQM), was recorded (5).

1.1 Modern Quality Management Systems – The Kaizen Strategy

Managers make daily permanent decisions, while managing companies and organizations, which are based on important analysis of situations and with the goal to improve quality. Therefore, methods and tools for correct analysis of situations and involvement in processes and quality management are part of daily practice (2). Due to globalization of economy, managements of companies and organizations look for savings, to lower expenses, to be flexible, and to achieve a more competitive position. Companies more often confront their competition. Successful companies act as role models for others. It is common practice that companies compare themselves to industry leaders with the largest growth, profit, and brand. This way and by utilizing various resources they aim to achieve better results as well as to overtake their competitors. Globalization is today the only specific characteristic of business. For companies to survive the market situation, high volume of good competition, increase in prices and other aspects, they are forced to implement in their practices modern management quality systems.

Leader in achieving high productivity and quality are Japanese industrial companies. These currently specialize in flexible manufacturing technologies. Even European companies slowly implement systems of Japanese manufacturing companies. Slovak companies are no different. One of progressive Japanese quality management systems in companies is the Kaizen strategy. It has been used in Slovakia and in Czech Republic since 2000.

Experience and expertise of manufacturing companies highlight the need for a perpetual improvement of systems, especially of quality processes. We can state that if a company wishes to be successful in a market, it needs to implement innovation and modern strategies that support growth, provide competitive advantage, help attain profit, and maximize market value of the company. We do not wish to contradict opinions of the scholarly and professional public about the Japanese management systems of companies, however, in our article we would like to point out benefits and advantages that implementation of Japanese systems bring. It is worth noting that Japanese companies develop and manufacture products with the help of modern quality management systems. It was proven, that successful companies were able to forecast changes and react to them in time, while they were still manageable. The „How to manage changes“question can be answered very simply, that is „By implementing the Kaizen strategy“. Author Masaaki Imai (Kaizen, 2012, p. 16) as a first person came with the idea that in case of the Kaizen strategy, it is a strategy that can help deal with changes of the new millennium.

1.1.1 Kaizen –Basic Definition of the Strategy

The Kaizen strategy can be defined based on terms determined by several authors. However, Masaaki Imai, the creator of the strategy defines the strategy most appropriately (1). The basis of the term is simple and clear: Kaizen means to improve and to perfect. Lecturers of the Kaizen Institute of Czech and Slovak Republics define the Kaizen strategy as a process of change. In our article, we will also define the Kaizen strategy as a process of change. The Kaizen strategy encompasses other techniques and tools, which are necessary for successful application of the strategy in a company.

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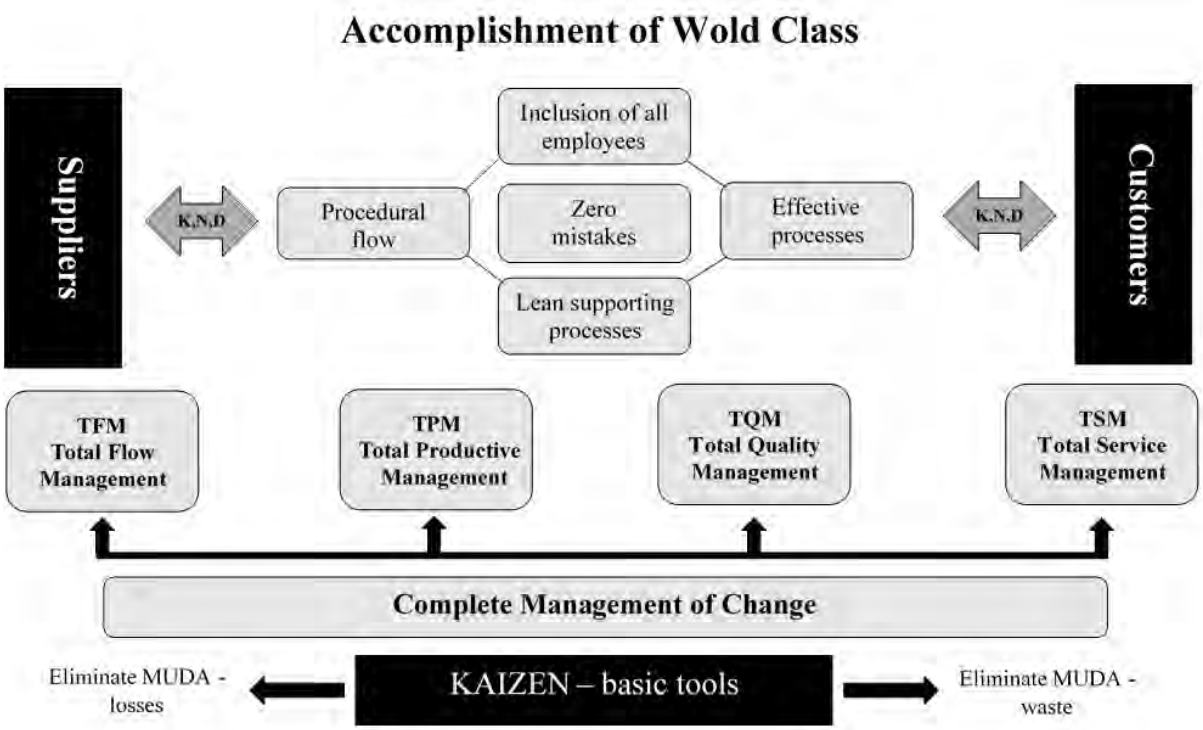
By combining all techniques and tools we create a wholesome system, the Kaizen Management System, KMS. It is a system for a company‘s long-term profit and growth. It has four basic pillars: TFM – Total Flow Management, TPM – Total Productive Maintenance, TQM – Total Quality Management, and TSM – Total Service Management, that is tied to the TCM – Total Change Management methodology with a change in thinking. The main goal of KMS is to continuously improve from supplies of materials and subcontractors to completely fulfilling customer’s expectations. Main tools are: inclusion of all employees and use of their creativity, set up of all processes, zero tolerance of mistakes and defects, effective use of equipment and technologies, use of systems of lean production and QCD – Quality, Cost, Delivery .

(Picture 1) The basis for creating the system is to open one’s consciousness and to utilize (MUDA) and basic tools, Kaizen Foundations. These are mainly: the 5S method, standardization, problem solving story, and using visual management.

Picture 1: Kaizen Management System



Source: interpretation by Čierna

1.1.2 Paradigm and Ways to Eliminate It

The term paradigm stands for a sum of specific opinions, ideas, values, and processes that are shared by a specific group of people. It is a way of thinking, which influences our ability to interpret daily situations or problems. In practice we see a common phenomenon that we cannot eliminate problems. It is caused by a stereotypical or a commonly used approach to solving daily situation and problems. It is common that each person acts according to accepted paradigms. True solution of problems is based on a new view of a problem, change in thinking in all aspects. This means, ability to eliminate all implemented paradigms and to see a problem as a challenge and try to fully remove it with the new approach. If we want to eliminate paradigms, we need to change our thinking.

To change one’s thinking, we can use some suggested tools that are intended for this use. The basic tool for change of thinking is benchmarking. Another one is change in perception,

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which stems from active participation in the process of change, continuing education, and training of determination. Experts of the Kaizen strategy consider changing one's attitude as the fastest way to change thinking. And in the changed attitude run a pilot project. Change in thinking will also bring visible, positive changes.

1.1.3 MUDA and GEMBA

This is basic terminology of the Kaizen strategy, which we will use throughout our article. MUDA can be characterized as waste, loss, deterioration of values, incorrectness. In case that we are able to uncover MUDA, we have successfully uncovered potential profit. The goal of elimination of MUDA from the manufacturing process is to always decrease costs, current or potential. In the manufacturing process, activities tied to adding value to a product could also add to decrease of its value (3).

In the manufacturing process we observe an unlimited amount of MUDA. According to the creator of the Kaizen strategy, Massakiho Imaia, MUDA is eternal and it will never be fully eliminated from processes. In practice we encounter seven most common types of MUDA:

- Waiting – for example waiting for managers' decisions, orders, supply of materials, arrival of transport, repair of production line;
- Inventory – extend delivery time, locked-in money, takes up production and warehouse areas, extends manipulation time;
- Transportation – requires time that needs to be paid, increases costs for transport technology, increases risk of damaging the transported product;
- Defects – present increase in repair costs, slow down production, etc. These are not waste;
- Over-Processing – incorrectly established procedure or production process and time extension due to losses from storage, transport and defects;
- Overproduction – manufacturing into warehouse or for inventory
- Motion – require time, cause fatigue that can lead to injuries, absenteeism and defects (Picture 2).

Picture 2: Severn Types of MUDA

Source: interpretation by Čierna

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GEMBA is another term used in the Kaizen strategy. It means or identifies a place where values are created, where improvement of company's processes takes place and creates place for initiatives to achieve changes. This place can be a workshop in the production process, a warehouse in a service process or an office in administration. Additional term is GEMBUTSU. It is defined as the real product.

As we have indicated above that MUDA cannot be completely eliminated, but its influence can be minimized. Any employee, of any age, at any hour, anywhere, and at any point of the company's process can try to eliminate MUDA. In this part of our article we can also define an approach of the Kaizen strategy, which means: go to GEMBA, watch GEMBUTSU and apply Kaizen.

1.1.4. THE 5S METHOD

This method is considered to be the basic tool of the Kaizen strategy. It is the corner stone for implementing other, more advanced, methods. The method was taken from standards of the American Army and in a broader meaning of the word can be defined as „making leaner". The method does not require any advanced management techniques. We deal with five Japanese words:

- Seiri – sort - sort out and separate that which is needed and not needed in the area, the result is selected material, more room, awareness, system and bigger flexibility;
- Seiton – straighten – arrange item so that finding them will require the least time and effect. All things have their place and this way we eliminate unnecessary searching and waiting– MUDA.
- Seiso – shine – tools, work environment and warehouse areas are to be maintained clean and try to remove all sources of pollution. Equipment is in the best possible shape.
- Seiketsu – standardize - develop standards that help maintain the state of formally implemented steps; and
- Shitsuke – sustain – create a 5S culture, self-discipline, control.

The 5S method cannot become only a formal project, it needs to become the essence of the company. Implementation of the 5S method requires inclusion of employees of all organizational levels.

1.1.5 Visual Management

It is a sum of graphic tools, pictures, and aids that can clarify an entire process and help understand situations and company processes to all interested parties. We can state that visual management allows employees to quickly understand the state of a process, standards, deviations, and many other factors. Among techniques of visual management belong: color coding and labeling, graphics, signals, boards, diagrams, picture documentation, and more. Visual management should be understood as a tool, not as a goal of a company. Appropriate visualizations are: interaction of processes, problem solving story, action plans, standards and basic reasons for bad quality, visualization of optimal workload for employees at a production line.

1.1.6 Kaizen Teams

Experience shows that people who work as part of a team achieve better results than when working independently. One of the priorities of a company should be to create a more productive and effective organization based on teams. To rely only on loyalty of top performing and knowledgeable employees is very risky.

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Kaizen teams with their continuous approach use all resources to solve daily problems and to make decisions at work, and the team takes responsibility for these. A team comprises of people whose common goal is to perpetually improve their work. Professional knowledge and personal experience should complement each other.

Education and development are one of the basic conditions of preparedness of a Kaizen team to solve problems related to MUDA. Team members need to learn a number of methods and techniques, which they have until now not used in their work. It is imperative that they have absolute support of the company‘s management.

2. Application of the Kaizen Method in Specific Companies in Slovakia

When applying the Kaizen method in companies we focus on comparison of companies where the Kaizen method has already been applied (two companies) with a company that does not use the method in their processes. By appropriately applying this method, we can achieve a more flexible company and better results when utilizing the same resources. We will focus on specific steps, tools, and methods of application of the Kaizen method in companies. The secondary aim will be to show advantages of application of the Kaizen method in the manufacturing and management processes of a company.

For the purpose of this article we have analyzed two companies that operate in Central Slovakia where the Kaizen method is applied and used in processes. The third studied company is a leading paper and pulp producer from Central Slovakia. This company had not implemented the Kaizen method for process management and quality improvement. Due to sensitive information about each company, we do not indicate names of the companies that were used in this study. Through a structured dialogue, we focused in these companies on the level of use of quality management systems and use of standard, modern, management quality systems. After data analysis, we have observed the following results.

3. Results and Discussion

When applying the Kaizen concept and using its tools and methods, we suggest to **consult** with professional, consulting organizations, which have successfully implemented this concept in numerous organizations. A decision to implement Kaizen must stem from a **need to optimize processes** of a company, **to eliminate problems**, **to achieve effective manufacturing**, **to decrease costs**, **to be more competitive,** and **to achieve better placement on the market**. We do not recommend implementing the Kaizen method as a modern trend since implementation could have an opposite effect.

We have come across interchangeable use of the term Kaizen and innovation. Both concepts of improvement, Kaizen and innovation, can be implemented at any level of company’s chain of processes. Kaizen is usually implemented in research and development, and innovation is part of marketing. The impact of the Kaizen strategy is more noticeable in manufacturing and in sales, while innovation is more applicable in science and technology (Picture 3).

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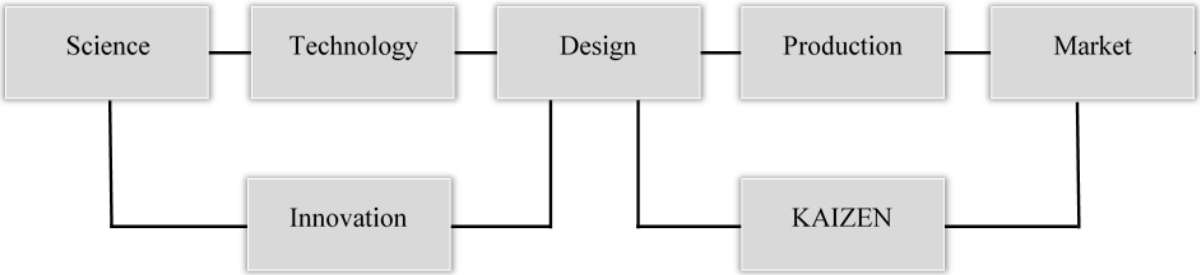
Picture 3 Entire Production Chain



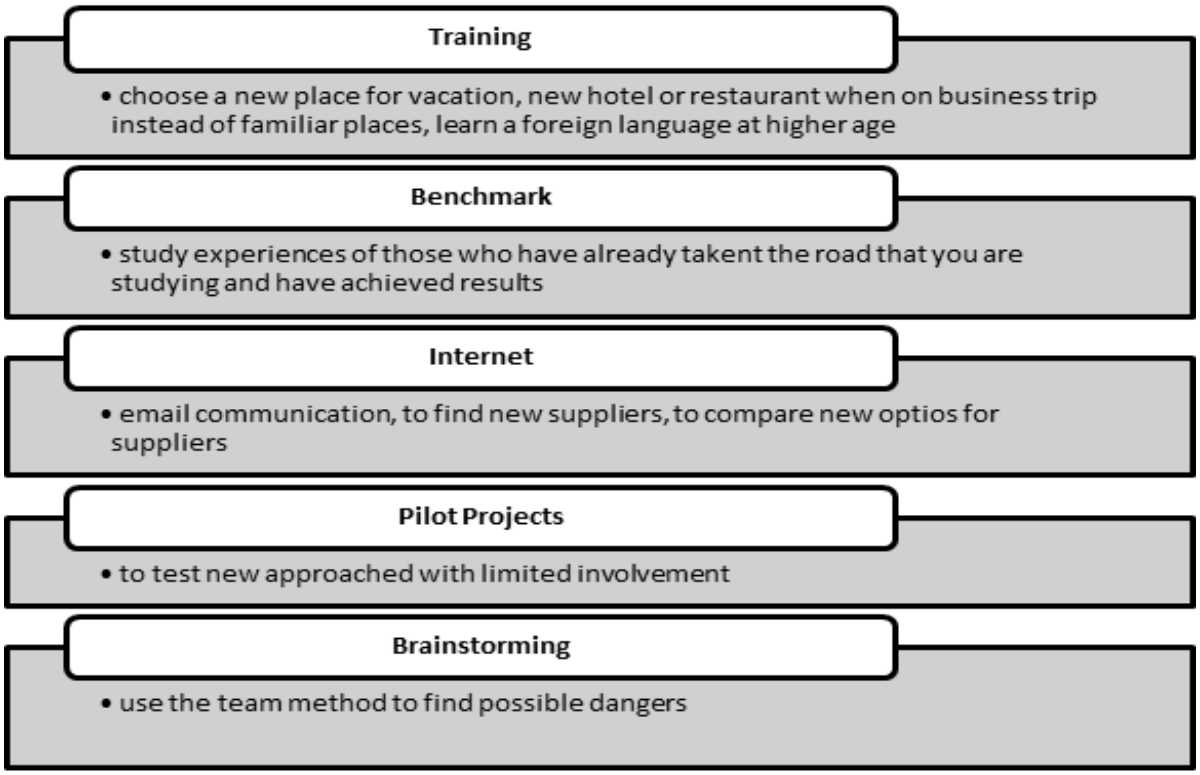
Source: Masaaki Imai, Kaizen

Another aspect of the Kaizen strategy and methods for process improvement, which remains misunderstood, is "pressure"of management to achieve immediate results. This forces employees to focus their attention on innovation, and as a result they do not address optimization, complete improvement of processes, and flexibility of the company.

Improvement and perfecting of processes with the use of Kaizen methods is gradual and often not noticeable, while its effects are more visible in the long run. We recommend managements of companies to be patient when expecting results. We appeal to instead of strictly evaluating based on results rather reward efforts to improve.

Application of the Kaizen method in a company can be successful only is the company's management and employees are open to changes. Successful improvement that leads to a more effective company is accompanied by fear of change, fear of risk, and concerns about results. We recommend overcoming these fears by analyzing studies about improvements, conducted with leading companies.

To decrease the risk of failure during implementation of changes, we recommend adhering to the following algorithm:



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Finally, we recommend that companies **standardize** achieved results in an appropriate format, for example by published **internal guidelines** that update the new processes. We can say that there is improvement only if in the near future processes are carried out according to the new standard. We recommend that company's management strictly supervises adherence to the new standard shortly after its implementation. One variable of implementation of the Kaizen method in a company is the fact that it forces company's management to consider when existing standards were last reevaluated. In terms of this strategy of company management, we recommend that companies during some interval reevaluate their existing standards and try to improve them.

We have achieved the following based on suggested measures of the Kaizen method:

- minimal and controlled inventory of material entries
- profitable costs for storage
- quicker reactions to requirements from manufacturing as an internal client
- higher satisfaction of internal clients

In conclusion, we would like to recommend that companies pay adequate attention to problems. Problems should be understood as opportunities for improvement. Where there is no problem, there is no opportunity for improvement. In a company, anything can constitute as a problem; something that causes problems to employees on various levels, employees in other processes or to end customers. Experience has shown that a person that is causing a problem is not directly affected by this problem. We recommend that an individual not transfer a problem to another process.

The worst that an employee can do is to ignore a problem, hide it or deny it. On the contrary, if management supports Kaizen and motivates employees to improve, employees are ready and capable to identify and solve problems.

We recommend using every opportunity to improve the company, to apply the Kaizen method, because at the beginning of Kaizen is always a problem.

4. Conclusion

The aim of the article to was offer a process of application of the Kaizen method in a specific company, based on analysis. With the help of appropriately selected Kaizen tools we have in a specific company eliminated a problem of increased costs for storage of inventory of material entries and raw materials in the manufacturing process. Based on the results, we suggested measures to the company to eliminate the problem at hand.

In the theoretical part of our study, we concentrated on presenting theoretical information about tools and methods of quality system management. Additionally, we offered a position to the Kaizen method, which Slovak companies are adopting. We focused on analysis of two companies, which used the Kaizen method in their daily activities. We based these on internal resources of both companies. In the third company, through a structured dialogue, we determined level of use of methods and tools of a quality management system. We have determined a problem, which management of the company had not been solving. In the third part we have evaluated benefits of application of the Kaizen method in companies. We made recommendations to the companies of other tools of the suggested concept, which will allow the companies to improve processes and will lead to overall flexibility.

We believe that our suggestions and recommendation for each company, which are outlined in part three, will contribute to wider use of the Kaizen method in Slovak companies.

Acknowledgement

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Dynamics of the development of the rate of the entrepreneurship of eastern Poland relating to the country in years 2006 – 2014

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Abstract
The article presents results of the research on employment trends in the Eastern Polish 2006-2014. The study included rural and urban-rural provinces. The entrepreneurship indicator was resented as a number of registered in the region system for 10 thousand inhabitants in the production age. The ascertain it increased growth rate of entrepreneurship in the area of eastern polish background of the country.

Keywords: *development, East Poland, entrepreneurship*

JEL Classification: *R11, R12*

1. Introduction

Eastern Poland marco – region is lowest level of economic development area in Poland and one of the weakest in whole United Europe. Consist of the provinces: podlaskie, warmińsko – mazurskie, lubelskie, świętokrzyskie i podkarpackie. Determinants of unprofitable affecting the socio – economic situation and development prospects of the area largely to structural dimension, which is the consequence of historical circumstances. Additionally, they are negatively reinforced macro – effects of peripheral location at the external border of the European Union, for which there are areas still lagging behind in socio – economic context. Kiss (2011) found that competition in the Central and Eastern European domestic markets increased significantly after accession as a result of massive import penetration.

Through the specificity of the social – economic situation in Eastern Poland is an area of special interest for regional policy requires further action and more dynamic development. Effectively implemented will contribute to increase the social – economic cohesion of the entire country. Therefore, in 2008. The Council of Ministers adopted a strategy for socio – economic development of Eastern Poland 2020 – the governmental strategy addressed to a group of provinces. In long – term financial frames of the European Union for years 2007 – 2013, the macro – region was provided with the special support by the form of operational programme Development of Eastern Poland 2007 – 2013. Character and the scale of challenges standing in front of Eastern Poland in the context of changing conditioning caused that a continuation of public action was essential, leading to effective use of the internal potential of the macro – region and eliminating barriers complicating and slowing down developmental processes occurring in it. The major constraints facing the sector comprises the stringent legal and regulatory environments, poor access to markets, shortage of finance, inadequate business information, absence of business premises (at affordable rent), lack of technical and managerial skills, very limited access to appropriate technology, absence of access to quality business infrastructure, and in some cases discriminatory regulatory practices (Mead, 1998).

In provinces of Eastern Poland larger problems have young persons (up to 24 years) to find employment than on average in the country – the unemployment rate in this age group ranks

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higher than the national average (from 17.2% in Podlasie, to 19.4% in Lubelskie with the national average of 16.6% in 2014). Simultaneously value of the indicator of the employment of young persons in four provinces of the macro – region (except the province of Świętokrzyskie) is lower than the average in the country (from 17.8% in Podkarpackie to 19.9% in Świętokrzyskie and Podlaskie towards the national average of 24.7% in 2014 r.). Low professional activity of young people is to some extent caused by the continuation of the learning on the higher level, whereas high unemployment rates young people suggest that people who want to participate in the labor market, cannot find jobs, results in movement of labor to urban centers located outside the Eastern Poland. Usually cities such as Warsaw, Krakow and Tri – City, which have a wider range of jobs.

Employability of contemporary Polish economy is mostly determined by entrepreneurship and small entities. The entrepreneurship is a process of creating something new and valuable, with assuming personal financial, psychological and social risk, but also with establishing cash compensation and personal satisfaction (Hisrich, 1992).

An ability of the job creation, the allocation and the personnel management is the most interesting function of the entrepreneurship. Every new company except investments and administering capital is connected with an increase in employment, and consequently with fall in unemployment. Stimulating the entrepreneurship by creating practical conditions for the functioning of enterprises is one of crucial treatments stimulating the social – economic development. However, for the entrepreneurship development, only economic appropriate conditions will not be enough, proper politics of the state is also need supporting undertaking the business activity.

The second pillar of the employment policy of the European Union assumes that creating the substantial amount requires better places of employment of favorable terms for the entrepreneurship development. Development strategy of the region, positive attitude of local authorities are social – economic main factors influencing development level of entrepreneurship in the given region.

In the mid – nineties the nineteenth century, the concept of unemployment in the sense of forced inactivity introduced the English economist J. A. Hobson. The contemporary economics literature is highlighting three characteristics of the unemployed person: remaining jobless, being job – hunting and ready for the startup (Kwiatkowski, 2007).

According to the Central Statistical Office unemployed person is a person aged between 15 and 64 years who, during the reference week was a non – working person; actively looking for a job and was ready to take up work during the examinations week and next. Unemployed are also people who are not looking for work because they expected to take up the work that had been promised, but they waited for taking up work not longer than three months and were ready in order to take this work up. Persons studying in the system of the education under the daily procedure aren't the unemployed (GUS, 2014). According to article 2 section 2 point 2 of the Act on employment promotion and labor market institutions of 20 April 2004, the unemployed person is understood a person not employed and not performing other paid work, able and ready to take on a full-time basis in a given profession or service or other paid work, registered in the proper place of residence for permanent or temporary district office work and seeking employment or other gainful employment.

Analysis of the unemployment and the entrepreneurship development is a subject of the study in the macro – region of Eastern Poland based on data of the Central Statistical Office. Analysis is taking into account the specificity of the entire region as well as individual provinces entering his composition: Lubelskie, Podlaskie, Podkarpackie, Świętokrzyskie

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and Warmińsko – Mazurskie. Depending on the availability of source data survey covered the years 2006 – 2014.

1.1 Characteristics of Eastern Poland

Provinces of Eastern Poland belong to most poorly of developed regions in Poland and entire European Union as the state reason of creating on years of 2007 – 2013 and 2014 – 2020 of special fund for five poorest regions which are showing the lowest GDP per capita in the expanded European Union.

Individual NMS performances were affected by policies implemented after 2004 and 2007. One of the most important was introduction of the CAP. According to the Copenhagen agreement, the NMS could choose between a simplified area – based payment system (SAPS) complemented with additional support for rural development; and implementation of the EU – 15 type CAP. All NMS, except Slovenia and Malta, opted for the simplified payment system, whereby the direct payment was 25 per cent of the EU – 15 level in 2004. The NMS had the freedom to top up the direct payments initially to 25 per cent of the EU – 15 level. They could transfer part of the rural development support to the direct payment or use national funds (initially a maximum of 30 per cent above the set EU level); all of the NMS used this latter opportunity but to different degrees. Despite the fact that the NMS were not eligible for the total payments of the EU – 15, the CAP has significantly increased farmers' incomes (Csaba, Attil, 2013).

The border of studied region is along the Vistula with the exception of the zone of influence of Warsaw. Provinces they hold 31.7% of the country and are inhabited by 21% of the population in Poland. The region of Eastern Poland is bordering with: Lithuania, Russia, Belarus, Ukraine and Slovakia (GUS, 2014).

Picture 1. Map of Poland with the division into Eastern Poland including provinces.

Source: http:/geo.stat.gov.pl/

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The labour market of Eastern Poland towards markets of the country as well as European is characterized by a low level of the employment and the occupational activity, as well as the highest unemployment rate. The unemployment in the Eropean Union has economic character and in Poland structural. It is connected primarily with developmental disproportions in the spatial arrangement and the maladjustment of the supply of the work to the demand for it. Table 1 shows the unemployment rate registered on areas of Eastern Poland with particular years. The Warmińsko – Mazurskie province is characterized by the highest unemployment rate, however the slowest pace of development of the labour market was recorded in Podlaskie.

Table 1: unemployment rate registered of provinces of Eastern Poland relating to the country in years 2006 and 2014.

Subdivision	Total [%]	
	2006	2014
WARMIŃSKO-MAZURSKIE	23,6	18,7
ZACHODNIOPOMORSKIE	21,5	15,5
KUJAWSKO-POMORSKIE	19,2	15,5
PODKARPACKIE	16,4	14,6
ŚWIĘTOKRZYSKIE	17,7	14,1
PODLASKIE	13,3	12,9
LUBELSKIE	15,5	12,6
LUBUSKIE	19,0	12,5
ŁÓDZKIE	14,7	11,8
OPOLSKIE	16,2	11,8
POMORSKIE	15,3	11,1
DOLNOŚLĄSKIE	16,6	10,4
MAŁOPOLSKIE	11,3	9,7
MAZOWIECKIE	11,8	9,6
ŚLĄSKIE	12,7	9,6
WIELKOPOLSKIE	11,7	7,6

Source: Own calculations based on data from the Central Statistical Office

The registered unemployment rate is calculated as the ratio of the number of registered unemployed to the number of economically active population. The unemployment rate is determined with taking into account working in privately owned farms in agriculture, being a component of the civilian professionally active population. They are estimated on the basis of the results: National Census of Population and Housing and Agricultural Census.

Rural area surface of Eastern Poland occupies 32.5% of the entire rural area of the country. In this region, there is a higher share of rural areas in relation to the total surface in other parts of the country and amounts to 95.7% (from 98.5% in the Warmińsko – Mazurskie to 96.12% in Podkarpackie) compared to 93.2% on average in the country (Table 2).

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Table 2: Total area and rural areas.

Total area and rural areas in km²				
	Subdivision	**Total**	**Rural areas**	**Participation of rural areas in the total area (%)**
1	**WARMIŃSKO – MAZURSKIE**	24173	23819	98,54
2	**PODLASKIE**	20187	19707	97,62
3	**ŚWIĘTOKRZYSKIE**	11711	11430	97,60
4	LUBUSKIE	13988	13642	97,53
5	OPOLSKIE	9412	9176	97,49
6	**LUBELSKIE**	25122	24476	97,43
7	WIELKOPOLSKIE	29826	29030	97,33
8	KUJAWSKO – POMORSKIE	17972	17383	96,72
9	ZACHODNIOPOMORSKIE	22892	22052	96,33
10	**PODKARPACKIE**	17846	17153	96,12
11	MAZOWIECKIE	35558	34106	95,92
12	ŁÓDZKIE	18219	17381	95,40
13	POMORSKIE	18310	17373	94,88
14	MAŁOPOLSKIE	15183	14330	94,38
15	DOLNOŚLĄSKIE	19947	18530	92,90
16	ŚLĄSKIE	12333	9092	73,72

Source: Own calculations based on data from the Central Statistical Office

Błażejczyk – Majka, Kala and Maciejewski (2012) use FADN data to find out whether a higher specialization and a bigger economic size class of farms determine a higher technical efficiency at the same scale for the farms from the new and old countries of the EU. Results recorded for mixed farms in relation to the pure technical efficiency indicate a bigger efficiency of the farms from the "old" EU regions (EU – 15) in comparison to the farms from the "new" regions, except for the biggest farms.

Along with the socio – economic development of the country rural areas are developed multifunctional, a larger group of farmers take the activity outside farming, taking gainful employed or provide services. Non – agricultural employment is of particular importance in the development of Eastern Poland. Coming into existence of new places of employment is connected primarily with a development of small and medium enterprises sector.

Development of agricultural output is another key indicator of assessing the EU enlargement impact. There are significant differences regarding the index of agricultural output in the NMS. It can be seen that Baltic countries and Poland increased gross agricultural output significantly in real terms over the period from 2000 to 2011. The agricultural output in real terms decreased or remained stable in all other countries concerned. Note, that the latter trend is valid for the EU old Member States (EU – 15) as well as for the EU – 27. The highest agricultural output increase is observable in the Baltic countries and Poland (approximately +40% in a decade), while the largest decrease was in Bulgaria and Malta (around –25% in a decade). Moreover, as a consequence of unfavorable weather conditions, agricultural

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output in 2009 was consistently lower than in 2006 in all countries but the Czech Republic and Malta (Csaba &Attilla, 2013).

2. Data and Methods

The dissertation presents the results of research of concerning relations between the rate of entrepreneurship and the rate of unemployment and the dynamics of employment in the Eastern Poland. Entrepreneurship rate was expressed as the number of business entities registered in the REGON system per 10,000 inhabitants in the productive age. The model was expressed with the following formula (Iwańska & Bieńkowska, 2010):

$$Wp = \frac{P}{L} \times 10000 \qquad (1)$$

where:

Wp – rate of the entrepreneurship

P – number of registered business entities

L – number of inhabitants in the productive age

In order to determine the relation between value of the rate of the entrepreneurship and the employment a Pearson correlation analysis was conducted.

They conducted research based on data concerning provinces of the entire country coming from a local data bank of Central Statistical Office. In the procedure of calculating statistical data from years 2006 – 2014 were used.

3. Results and Discussion

The calculated rate of the entrepreneurship was expressed with dynamics in the period from 2006 to 2014 for individual provinces of Poland distinguishing the Eastern Poland macro – region (Table 3). Provinces of Eastern Poland are characterized by the lowest GDP per capita in Poland (GUS 2014).

Table 3: The growth rate of entrepreneurship in the provinces divided into rural and urban – rural in the years 2006 – 2014.

The dynamics of growth of the entrepreneurship			
rural communes		**urban – rural communes**	
DOLNOŚLĄSKIE	28,6%	DOLNOŚLĄSKIE	19,9%
KUJAWSKO-POMORSKIE	18,7%	KUJAWSKO-POMORSKIE	1,5%
LUBELSKIE	**20,8%**	**LUBELSKIE**	**11,5%**
LUBUSKIE	10,0%	LUBUSKIE	1,1%
ŁÓDZKIE	9,2%	ŁÓDZKIE	0,2%
MAŁOPOLSKIE	27,9%	MAŁOPOLSKIE	12,1%
MAZOWIECKIE	19,3%	MAZOWIECKIE	14,8%
OPOLSKIE	22,8%	OPOLSKIE	11,2%
PODKARPACKIE	**15,8%**	**PODKARPACKIE**	**8,1%**
PODLASKIE	**8,0%**	**PODLASKIE**	**19,5%**
POMORSKIE	24,3%	POMORSKIE	12,6%

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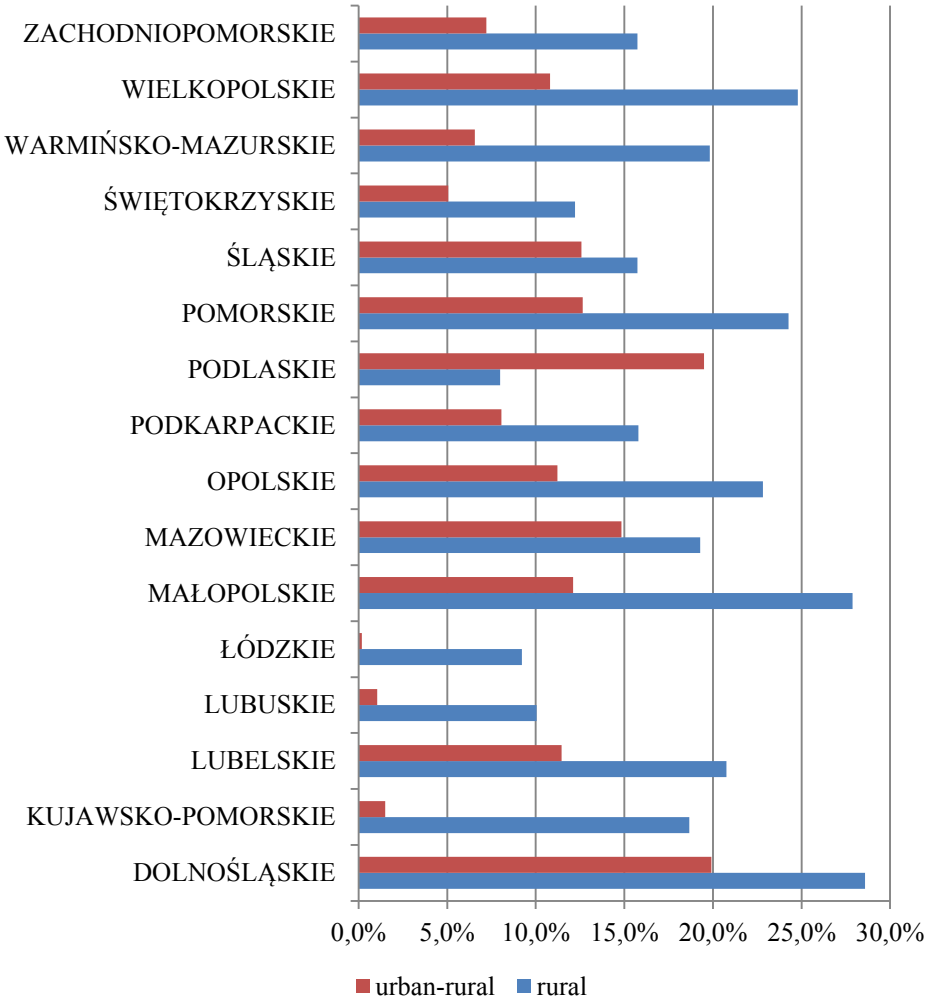
ŚLĄSKIE	15,7%	ŚLĄSKIE	12,6%
ŚWIĘTOKRZYSKIE	**12,2%**	**ŚWIĘTOKRZYSKIE**	**5,1%**
WARMIŃSKO-MAZURSKIE	**19,8%**	**WARMIŃSKO-MAZURSKIE**	**6,6%**
WIELKOPOLSKIE	24,8%	WIELKOPOLSKIE	10,8%
ZACHODNIOPOMORSKIE	15,7%	ZACHODNIOPOMORSKIE	7,2%

Source: Own calculations based on data from the Central Statistical Office

There is a noticeable uptick of the rate of the entrepreneurship over the analyzed years in each of the studied regions, however provinces of Eastern Poland are standing out smallest with his value. After all, the development of Eastern Poland macro – region stands out growth dynamics. The Podlasie province is characterized by the greatest growth dynamics of the rate of the entrepreneurship in urban – rural communes (table 3) which simultaneously the last place is recording in rural communes. At the same time Podlasie province notes, as only, bigger increase of dynamics of the rate of the entrepreneurship in urban – rural communes than in rural communes. It is connected with the social – economic significant development of small cities in this province.

Figure 1: Growth dynamics of the rate of the entrepreneurship of the Eastern Poland macro – region relating to the country.



Source: Own calculations based on data from the Central Statistical Office

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For an increase in demand for the work in the market economy a sector of small and medium enterprises is outweighing. In Poland the determined majority of companies belongs to this sector which are employing: to 9 persons – micro enterprises, 10 – 49 persons – small – sized enterprises, 50 – 249 persons – medium – sized enterprises.

The situation of the labor market in rural areas also illustrates the summary of the unemployment rate, the average area of agricultural land and the urbanization rate by provinces (Table 4).

Table 4: Comparison of regional employment in agriculture, unemployment rate, household size and urbanization degree.

	Subdivision	Percentage of people working in agriculture	Average area of the farmlands in the household ha	Unemploy-ment rate (%)	Urbanization rate (% city population)
1	***LUBELSKIE***	45,1	7,7	12,6	46,22
2	***ŚWIĘTOKRZYSKIE***	39,2	5,6	14,1	44,64
3	***PODKARPACKIE***	37,7	4,3	14,6	41,35
4	***PODLASKIE***	37,1	13,6	12,9	60,48
5	MAŁOPOLSKIE	26,7	3,9	9,7	48,62
6	ŁÓDZKIE	23,8	7,7	11,8	63,23
7	***WARMIŃSKO-MAZURSKIE***	20,4	21,5	18,7	59,16
8	OPOLSKIE	19,8	14,8	11,8	52,02
9	WIELKOPOLSKIE	19,5	12,7	7,6	55,07
10	KUJAWSKO-POMORSKIE	19,3	14,9	15,5	59,83
11	MAZOWIECKIE	16,7	8,9	9,6	64,25
12	LUBUSKIE	14,1	16,7	12,5	63,09
13	ZACHODNIOPOMORSKIE	12,9	22,3	15,5	68,65
14	POMORSKIE	11,1	16,2	11,1	64,87
15	DOLNOŚLĄSKIE	10,7	13,2	10,4	69,28
16	ŚLĄSKIE	7,8	6,3	9,6	77,26

Source: Own calculations based on data from the Central Statistical Office

This comparison demonstrates how important for the development of the situation of farms in a small area is the development of infrastructure and non – agricultural employment. For the development of the province location of the economic centre has crucial meaning. In Table 5 it is possible to notice that the Lubelskie province, the largest economic center which is Lublin, inhabited by 343,598 residents and focuses almost 35% of the region's population, reported the lowest unemployment rate in Eastern Poland. Whereas, in the Warmińsko – Mazurskie, with the largest economic center – Olsztyn (174,675 inhabitants), where lives 20.6% of the total number of inhabitants of the region and in the Podkarpackie, where the largest urban center is Rzeszów (183,108 inhabitants), which concentrates 20.0% of the total region's population, the unemployment rate is the highest.

In order to examine strength of the interdependence of two variables, the unemployment rate and the rate of entrepreneurship were calculated correlation coefficients, which amounted to – 0.51.

Analyzing the received result meaning correlation between the height of the rate of the entrepreneurship and the fall in the unemployment rate of the year registered with 2014 was observed. It means that with the growth of enterprises, the number of unemployed people is reducing. Passing the employee on its own account is reducing burdens of non – pay labors costs of the enterprise, contending with financial problems. The development of the self – employment has also considerable meaning from an unemployment point of view. It creates for job seekers an additional option to return to the store of working persons. This form of the business activity in the initial period does not often transfer into the creation of new jobs for the unemployed. Analyses shows that the Świętokrzyskie province is an exception, where the interdependence is not appearing between two variables i.e. the jobless total and the number of companies.

4. Conclusion

Curbing the unemployment depends on the level of entrepreneurship level and the legal, financial and social environment of small and medium – sized enterprises. Conducted research based of statistical data showed that a slight increase in entrepreneurship is noticeable over analyzed years in each of the studied regions. Urban – rural communes of the Podlasie province are leading with the greatest dynamics of the rate of the entrepreneurship in 2014.

Exists a relationship between unemployment and an indicator of business what conducted analyses are pointing at. Over the analyzed years, i.e. 2006 – 2014 was observed a significant correlation between a decline in unemployment and a simultaneous increase in the rate of entrepreneurship in the provinces throughout the country. It means that along with increase the number of companies the number of unemployed people is reducing.

European Union funds are giving possibility to provinces of Eastern Poland for equaling of the social – economic development to areas of the country more quickly developing. Although there is noticeable increase in the pace of development of Eastern Poland, but it is not sufficient to compensate for the level of development in the country. The indicator of contracting centers in programs for years 2007 – 2013 was 84%. It is assumed that in the period 2014 – 2020 will be maintained both – the size and structure of expenditure on the main strategic areas of the Eastern Poland give a chance to sustain the pace of socio – economic development.

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Peculiarities of corporate social responsibility in veterinary pharmacy

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Abstract
The article is based on the fact that there are specific segments in the economy, which are called sensitive sectors. Despite the fact that they are often perceived as irresponsible in their nature, several effective communication tools can be taken for planning and managing positive corporate image. The present study is a part of a larger research that we want to conduct in the segment of veterinary drugs. Although there is a big scientific research potential, very little attention is paid to this area in the scientific literature. Corporate social responsibility (CSR) is an important phenomenon that affects current business models. Based on recent researches, we can identify a wide range of practical steps and forms that CSR can take. The main goal of the paper is to develop a design of the research, which will be subsequently implemented in further research, in which we will analyze (qualitative content analysis) collected data (basic corporate documents like mission, vision and corporate values). These documents are crucial to corporate strategies, and often deal with responsibility issues which are then transformed into business strategies, tactics and programs.

Keywords: *corporate social responsibility (CSR), veterinary pharmacy, sensitive sector, content analysis*

JEL Classification: *M14, M31, Q13*

1. Introduction

Pharmaceutical industry is both very admired and criticized, too (Nussbaum, 2009). The pharmaceutical industry is one of today´s most dynamic industries. The global pharmaceuticals market is worth US$300 billion a year, a figure is expected to rise to US$400 billion within three years (World Health Organization, 2016). Pharmaceutical industry has many peculiarities due to its specific character, like a top sophisticated research, fierce competition and regulations. Although the concept of corporate social responsibility (CSR) can be traced back to 50s pharmaceutical sector began to adopt CSR only about a decade ago. However, managers of pharmaceutical companies very soon understood, that it is very important to report on sustainability and responsibility and the number of firms is still increasing (Esteban, 2008). Pharmaceutical companies are often stigmatized due to the character of their production. Thus, their CSR is an appropriate tool to secure broader stakeholder support (Hillenbrand, Money, & Ghobadian, 2013). They are very closely scrutinized by various interest groups. Even though, these firms produce drugs and medicines to improve and maintain human and animal well-being, they are often perceived as "sin" (Grougiou, Dedoulis, & Leventis, 2016), sensitive industry (Kašparová & Kunz, 2013) or stigmatized sector (Vegne, 2012). The main reason is due to its nature and conflict between words and actions. Recent researches focus mainly on the pharmaceutical industry ethics and sincerity nexus (Countess of Frederiksborg & Fort, 2014; Nussbaum, 2009); a customer

perception and analysis of attitudes towards CSR activities of pharmaceutical firms (Wang, 2011); CSR as a means of public relation and reputation management (Cheah, Chan, & Chieng, 2007; Stone, Grantham, & Vieira, 2009; Leisinger, 2005); but also advantages of implementing CSR in the pharmaceutical sector (Droppert & Bennett, 2015). Although the main goal of the paper is to develop a design of the research, we assume it will be useful in our further research, in which we would be able to conduct a comparative analysis of pharmaceutical industry with other business sectors or to explore a strategic match between stated CSR programs and its core business, which could cause serious reputation problems in terms of sincerity of such activities (Countess of Frederiksborg & Fort, 2014). If there is a very weak or missing connection, it subsequently leads to fragmentation of the image, which can be clearly considered as waste of corporate resources. Otherwise, active CSR support can lead to stronger corporate brands, employee satisfaction, positive corporate image or teambuilding (Nielsen & Thomsen, 2007; Story & Price, 2006).

1.1 Definition of Corporate Social Responsibility (CSR)

CSR can be defined in many different ways. The main problem is that there is an ambiguity of what CSR entails (Džupina, 2013). In fact, there is no generally accepted definition of CSR. Definitions apply in specific time (historical context) and place. Definitions also vary according to a person, who articulated them (different stakeholder groups). We can identify at least 37 main academic definitions emphasizing the responsibility categories and issues (Dahlsrud, 2008). Although the notion of CSR as a concept is very vague, its influence on recent business models is of a high importance. The modern era of CSR is marked by the contribution of H. R. Bowen (Carroll, 1999). Bowen refers to the obligations of businessmen, when he speaks of CSR and the businessman is obliged to *"…pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society…*" (Bowen, 1953, p. 6). Later on, Carroll (1979) defined CSR as "*The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time.*" and formulated a four stage model of corporate social responsibility (Carroll, 1979). In 1960s, the definitions dealt mostly with the dimensions of voluntariness and it is believed, that companies should fulfill and enhance total socio-economic welfare (Frederick, 1960). Later on, Sethi (1975) started distinguishing among corporate behavior, so-called "social obligation," "social responsibility," and "social responsiveness." (Sethi, 1975). During 1990s, new definitions started to deal with internal and external stakeholder and also a new concept of "*Triple Bottom Line*" was placed (Elkington, 1999). The concept is based on social (people), environmental (planet), and economic responsibility (profit). There is also a very complex definition of CSR by Vogel, who claims, that CSR represents "*practices that improve the workplace and benefit society in ways that go above and beyond what companies are legally required to do*" (Vogel, 2005). According to the European Union, CSR is "*A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis*" (European Commission, 2001).

1.2 Advantages of implementing CSR into a corporate strategy

First of all, we would like to point out, that not all CSR practices necessarily have a positive impact on companies. It largely depends on how CSR is implemented in a business practice. There are in general two groups of companies implementing CSR. The first one does good to look good, and the second one does good to feel good, but there is also the third one which does good to last longer (Kotler & Lee, 2005). In order to take a real advantage of CSR, it is necessary to link it with activities of firms. Otherwise, CSR can be looked upon just as a

window dressing, just to look good (Nussbaum, 2009; Countess of Frederiksborg & Fort, 2014). Hence, is perceived just as an isolated action to gain higher profits. Important reasons for implementing CSR are defined by Porter and Kramer (Porter & Kramer, 2006; Sooyoung & Youngshin, 2009). Firstly, CSR is a (1) *moral obligation* (companies have to be "good citizens" and do the right things). The concept of CSR can also be seen as a means of (2) *sustainability*. The principle of sustainability emphasizes environmental and community stewardship (Porter & Kramer, 2006). Accordingly, companies also need tacit or explicit permission from governments, communities, and numerous other stakeholders to do business. CSR provides companies with (3) a license to operate. Thus they are able to avoid boycotts and litigations (Lee M.-D. P., 2008). A proactive CSR programs and policies can contribute to a better acceptance even in those business sectors, which are perceived as irresponsible in nature, e.g. pharmaceutical industry (Džupina, 2012). The last advantage, which Porter and Kramer reported to, is (4) a better reputation. A lot of companies use CSR as a tool of improving corporate image and build stronger brands (Hoeffler & Keller, 2002). The good reputation also enlivens morale (Porter & Kramer, 2006), and even raise the value of stock (Mackey, Mackey , & Barney, 2007). These activities mostly satisfy external audience. However, the results can be different from the theoretical basics (Dean, 2002). Other advantages are: (5) CSR helps to increase value in the value chain (e.g. cause related marketing) (Porter & Kramer, 2006 Mullen, 1997); (6) CSR is an important source of sustainable competitive differentiation (Porter & Kramer, 2006); (7) CSR increases customer loyalty and makes customer decisions easier (Dacin & Brown, 1997; Kotler & Lee, 2005); (8) CSR increases acceptance of a company across different cultures and provides a better integration to local communities (Kell & Ruggie, 1999); (9) CSR attracts socially-conscious customers and good employees (Laszlo, 2003; Kotler & Lee, 2005) and can also (10) develop new markets (Porter & Kramer, 2002). Moreover, Kotler and Lee (2005) mentioned other reasons, why companies should engage in CSR activities (Kotler & Lee, 2005). Hence, CSR also increases market share of company sales and also increases appeal to analytics (Countess of Frederiksborg & Fort, 2014).

1.3 Strategic corporate social responsibility

First of all, we would like to point out, that not all CSR practices necessarily have a positive impact on company's performance. It greatly depends on customer´s perception of such activities. As Countess of Frederiksborg, and Fort refer in their article, CSR-as-philanthropy can raise doubts about the sincerity of such a conduct (Countess of Frederiksborg & Fort, 2014).

We assume, that managements of companies should implement other forms of responsibility, which involve more effort, know-how and managerial skills. In other words, CSR should go strategic and support vision and mission of a company. Strategic management is a complex hierarchical process of interconnected elements (as shown in Scheme 1). In 1979, the same year Carroll published his CSR model, Igor Ansoff examined social dimension of strategic management and proposed, that a corporate strategy should interact with the company's environment to support legitimacy of business (Ansoff, 1979), or so-called a license to operate (Porter & Kramer, 2006). CSR becomes part of the corporate philosophy. Today's firms consider their influence on societal goals (Himman & Keim, 2001; Halme, Roome, & Dobers, 2009) and it leads to more active CSR engagement. Mission and vision are the crucial elements of company´s strategy. Their main purpose is to serve as your company's goal, articulates why the company exists and states corporate´s philosophy (Volberda, Morgan, Reinmoeller, Hitt, & Ireland, 2011). Moreover, it contains basic corporate values and positively influences formulating corporate goals and corporate strategies (David, 2011). Thus, if mission or vision contains elements of CSR, there is a promise, that through

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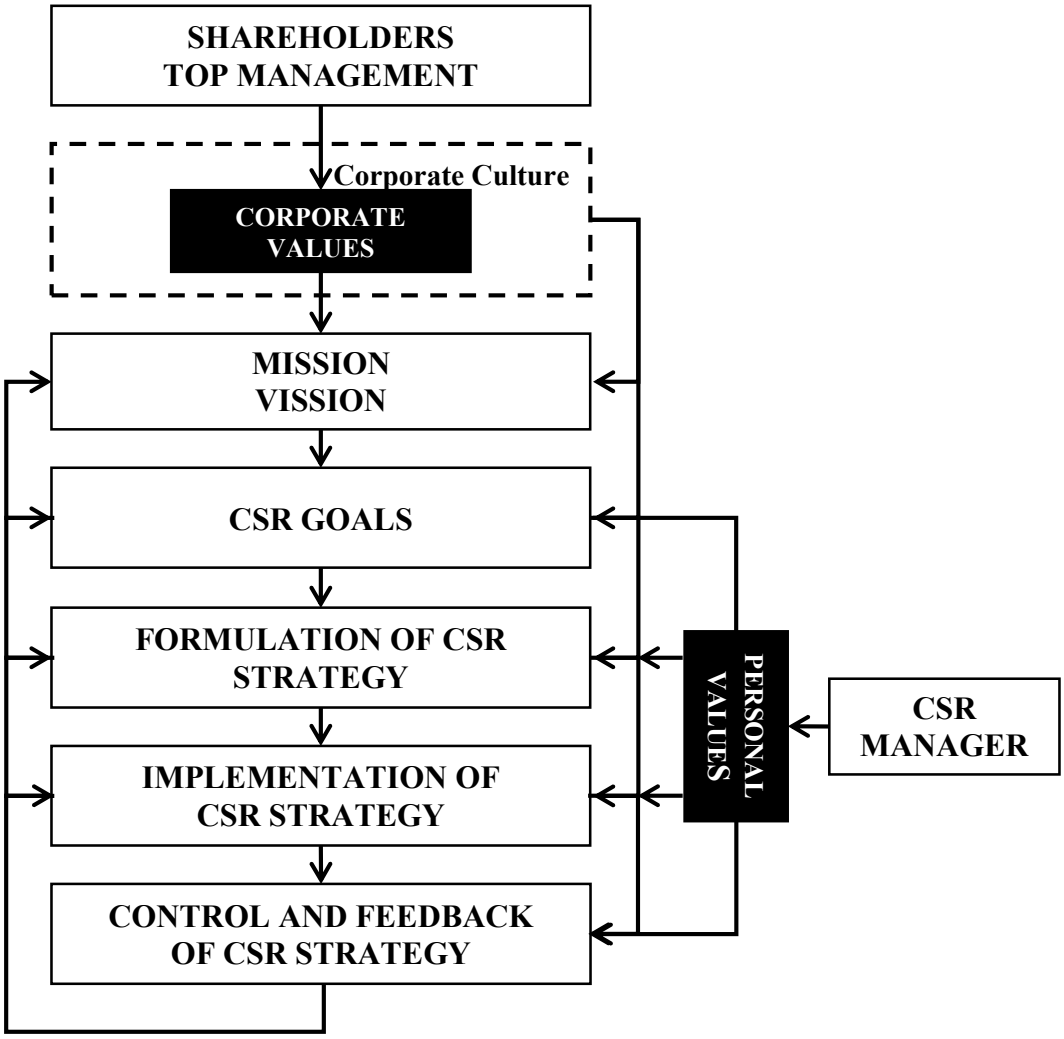
corporate strategy, it will transform to real actions of doing good and being sincerely responsible.

Scheme 1: CSR in the process of strategic management



Source: the survey

2. Data and Methods

The sample was obtained from the list of all veterinary drugs producers registered in the Slovak Republic. Most of them are branches of large multinational corporations, so they are very likely to have web sites developed. For the purpose of the study, we will analyze all 101 companies to cover the whole sector. The methods, which we will apply in further research will consist of several steps. First step is based on our previous research, in which, we have gathered a few definitions of CSR through a literature review from 1950s to a so-called millennium era (Džupina, 2012). The review of literature consisted mainly of journal articles registered in ScienceDirect, Web of Science and Scopus databases. Altogether, more than 50 definitions of CSR were analyzed. We have also included related terms like corporate social performance (CSP), corporate social responsiveness, sustainable development etc. in our previous research. The definitions were mostly of European, Asian and American origin. Subsequently, we identified basic pillars and dimensions of CSR in gathered definitions (as shown in table 1). Thirdly, we will gather company missions and visions from companies´ web sites and strategic documents. Companies were obtained from the list of veterinary drugs

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producers registered in the Slovak Republic. A content analysis with an open coding scheme (as shown in table 2) will be used to identify all dimensions in corporate missions and visions, possibly corporate values. A similar procedure was used in scientific papers and studies by several authors (Rafaeli & Sudweeks, 1997; Bartkus, Glassman, & McAfee, 2004). The content analysis will be used, as it allows us to collect data systematically and can be used to evaluate and later analyze qualitatively written text (Weber, 1990).

Table 1: Pillars and dimensions of corporate social responsibility

Stakeholders		• customers • employees • shareholders	
Voluntarism			
Obligations to society			
Pillars of sustainability	*Financial responsibility*	• corporate governance, • profitability, • product quality and safety, • ethical behavior, • CRM, • fight against corruption,	• transparency, • protection of intellectual property, • fair trade, • fair competition, • business and marketing ethics,
	Social responsibility	• health and safety at work, • employment policy, • education of employees, • employing the long term unemployed, • sponsoring and philanthropy, • corporate volunteering, • anti-discrimination policy, • fight against child labor,	• respecting human rights, • work-life balance • outplacement • humanizing workplace, • employee-friendly work environment, • equal working conditions, • partnership with stakeholders
	Environmental responsibility	• "green" corporate policy and culture • reduction of negative impacts on the environment, • "green" production and "green" products (ISO 14000, EMAS, etc.). • saving and protection of natural resources, • "green" investments, and investments to "green" technologies,	

Source: the survey

3. Results and Discussion

As we have conducted several researches on CSR, we are aware, that we cannot consider all difficulties, we will come across as the article is still only a draft of the future research. However, we are aware of several shortcomings of the research: (1) information provided by companies (missions, visions) are often only statements, which can be far from what is really done; (2) we do not consider weight (importance) of dimensions. Stakeholders can consider different dimensions important. (3) In future, more stakeholder groups should be included in the research. (4) Even though, strategic CSR as a part of corporate strategy shows better engagement of a company in dealing with societal issues, still there may be a false interest in social issues. It is apparent, that different missions, visions will probably refer to the same dimensions of CSR. Thus, a presented coding scheme (as seen in Table 2) will help us to group them together. In this way, we will be able to identify all dimensions, which apply in pharmaceutical industry and subsequently conduct further, more detailed research. In this way, we will be able to make a comparative study of pharmaceutical industry with others to identify peculiarities of CSR. Combined with the research on a perception of the whole

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industry and each of firms, we would be able to identify potentially successful CSR strategies and give practical recommendations.

Table 2: Dimensions of corporate social responsibility (Coding scheme)

Dimensions	Components	Examples
Voluntarism	Voluntarism, beyond legal regulations, ethical values	...we respect work values, principles of interpersonal relations and ethical principles... ...through volunteers projects and programs... ...consider and respect not only legal norms, but also... ...voluntarily... ... our responsibility goes beyond legal regulations …
Obligation	Depending on a business sector	...improving a quality of life... ...provide affordable drugs... ...promote an efficient use of resources for the benefit all people and our planet...
Stakeholders	Customers	...meeting their needs... ...customer needs/satisfaction... ...long-term relationships... ...it is important to protest customer needs...
	Employees	...meaningful work... ...contributing to employees' career development... ...equal opportunities... ...as we grow, our people grow too...
	Shareholders	...return on investment... ...reasonable profit... ...shareholder democracy... ...long-term benefits to our shareholders... ...protecting shareholders interests...
Profit	See details in Table 1	...fair business... ...provide the public with complete, true and accurate information... ...maintaining profitability... ...we want to make a reasonable profit...
People		...contributions to a better society... ...integration of social issues in business activities... ...taking into account the real impact on society... ...we respect one another, regardless of sex, age, skin color, religious and political beliefs and a level of knowledge and skills...
Planet		...cleaner environment... ...environmental stewardship... ...environmental issues in business operations... ...implement a waste-free processing...

Source: the survey

4. Conclusion

The pharmaceutical industry is in a very unique situation as its nature is to provide drugs and medicines for human and veterinary use. The core business is often subject to criticism by various stakeholder groups. We can very often come across definitions and notions that the only pharmaceutical responsibility is to provide affordable drugs and ensure availability of

remedies for various diseases. We argue, and it is also based on common definitions of CSR, that a responsible behavior should go beyond its core business (research, distribution, authorization and availability of drugs). Access to medicines is understood as a shared responsibility and numerous actors have a vital role to play in it (Lee & Hunt, 2012). However, pharmaceutical companies share substantial part of this responsibility. Nussbaum (2009) claims that if companies neglect their CSR, they can become an easy target for non-governmental organizations, journalists or consumer advocacy groups (Nussbaum, 2009). There might be an objections that CSR models vary from industry to industry, but we assume that the proposed design of research can be used in any sector respecting peculiarities of specific industries. There is sometimes a disparity between what is articulated in business strategies and what is really done by companies in terms of CSR. According to our previous research and surveys, we have found out that companies tend to formulate CSR principles close to their core business. Otherwise, CSR can be looked upon as a means of popularizing of products and companies (Khanna, 2006). However, we are aware of the limits of this approach. First of all, vision, mission or corporate values are only statements, which do not necessarily have to be put in practice. Secondly, the research is always conducted from a certain point of view, which subsequently affects the results. In our research, we draw the attention to managerial and scholar definition of CSR and its roles in pharmaceutical industry, which produce both human and veterinary medicines. Moreover, the article deals with a design of our research, which would be conducted in the future.

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Social responsibility of manufacturers of crystal glass in the context of ensuring food safety. Case study

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Abstract
The increasingly popular CSR concept implemented in the food chain plays an important role also in the context of the manufacturer's responsibility for the health of the users of the manufactured products. The synergy of CSR activities and the use of Good Manufacturing Practice (GMP) enables delivery solutions which ensure the desired and acceptable level of health safety, while respecting certain standards expected by foreign markets. Export to these markets requires, in addition to respecting certain international guidelines, also taking into the account socially responsible customer expectations. The presentation of the indicated relationships in the context of the solutions used in a particular company operating in Poland is the main objective of this article. This issue is examined on the example of the Crystal Glassworks Factory, which aspires to the position of an industry leader in the Polish industry of decorated crystal glass products.

Keywords: *corporate social responsibility, food safety assurance, good manufacturing practice, products intended to contact with foodstuffs*

JEL Classification: *M14, L15, L61*

1. Introduction

The changing circumstances of the operation of enterprises and increasing customer expectations related to the quality and safety of purchased products pose new challenges to the manufacturers. Risks associated with lowering the quality and safety of raw materials add fundamental importance to ensuring their desired level. This becomes especially important when dealing with the production of goods that are going to come in contact with food, because then safety must be considered in the context of food security. Food safety is not only a feature of food itself. In addition to the guarantee that there are no biological, chemical and physical risks concerning the food, it is also important to ensure the safety associated with the production and its rotation, including the use of appropriate packaging (Wysokińska-Senkus, 2010, p. 132).

At this point it should be pointed out that, nowadays, an important role in the context of manufacturer's responsibility for the health of consumers is played by the increasingly popular concept of corporate social responsibility(CSR). The synergy of the CSR activities is based on the sharing of knowledge in the food chain (Zięba, 2013, pp. 153-165), including the use of Good Manufacturing Practices(GMP) (Krajewska-Kołożyn, 2007, p. 43), which allows for a delivery of solutions to ensure the desired and acceptable level of health safety, while respecting certain standards expected by foreign markets (Anam, 2012, p. 4).

The concept of corporate social responsibility is an issue described in the literature, and has been put into practice for some time. However, the conscious and deliberate application of its principles in relation to specific areas of the business still raises - especially among some of the representatives of management in companies - specific discussions, or even doubt. One

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reason for this state of affairs can be - as it seems - the fact that the studies presented in scientific publications attempt to define it over and over again.[1]

At this point it is worth noting the definition of the concept of corporate social responsibility proposed by the European Commission. It connects social responsibility with the voluntary consideration by the enterprises of social and environmental issues. At the same time it is emphasized that this responsibility should enable the management of relations with various stakeholder groups which have an impact on the functioning of the company (European Commission, 2001, p. 5). This includes both internal stakeholders (owners, employees) and external ones, e.g. suppliers, business partners, contractors, and particularly customers.

Referring to the CSR approach preferred by the authors Y. Ch. Kang and D. J. Wood it is worth recalling that this responsibility - in the terms presented by them-means the obligation of the companies to comply with standards of moral and social values at every stage of their business (Kang &Wood 1995, p. 414). In this light, these moral norms cannot function without proper care for the health of customers and without providing food safety (Hartmann, 2011, pp. 297–324). This is reflected in the norms and standards which area kind of a "guideline" for actions towards realizing the concept of social responsibility. They include a document such as ISO 26000:2012 Guidance on social responsibility, as one of three documents recommended by the European Commission on the subject of social responsibility for European businesses.

This standard has not been developed for the purpose of certification. Its goal is to aid organisations in operating in a socially responsible way, which becomes a requirement for societies around the world and is no longer merely a matter of choice (ISO 26000). The standard indicates, among other issues, its key areas. Among them, a particularly important one from the point of view of consumer health and food safety, should be considered the area of practices in customer relations (ISO 26000: 2012, pp. 69-70).

The PN-ISO 26000:2012 norm does not indicate specific actions that entrepreneurs should undertake to assure the health of the users of their products. It does, however, pertain to the problems of food safety. As already stated above, the provision of that security requires a synergy of actions undertaken in relation to the theoretical assumptions and formal guidelines in the field of CSR and those directly concerning the issue of food safety. We can mention, for example: Regulation (EC) No. 1935/2004 of the European Parliament and Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing directives 80/590/EEC and 89/109/EEC (Journal of Laws, EU L 338/4 of 13.11.2004), and Commission Regulation (EC) No. 2023/2006 of 22 December 2006 on good manufacturing practice for materials and articles intended to come into contact with food (Journal of Laws, EU L 384/75, 29.12.2006).

Good Manufacturing Practice (GMP) is concerned with these aspects of quality assurance which ensure a uniform production of materials and products and their control to ensure compliance with the rules applicable to them and the quality standards (Commission Regulation (EC) No. 2023/2006, Art. 3 a). GMP is usually issued in the form of so-called Codes of Good Practice, which include all recommendations that are to be followed by the food manufacturer in order not to violate the sanitary regulations which are in force in the country.

During considerations on the issue of CSR in the context of food security, it should be remembered that the actualization of the concept of social responsibility in the area of

[1] Overview of these definitions in the Polish literature has been comprehensively included, among others, in (Sokołowska, 2013), (Craig & Lensen, 2009).

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ensuring the health and safety of food requires building relationships with customers based on respect for a diverse range of guidelines and standards[2].

In connection with the requirements of the new guidelines and standards, enterprises are obliged to supplement their materials and articles with a written declaration (declaration of conformity) stating that they comply with the rules applicable to them. There should also be implemented certain organizational solutions intended to ensure "traceability," i.e. traceability of materials and products in order to facilitate control, the recall of defective products, consumer information, and the attribution of responsibility.

Considering the above mentioned issues, the objective of this study was to demonstrate the solutions used in connection with the implementation of the concept of social responsibility in the area of food security in one of the companies operating in Poland. The authors of this study believe that the studied example of these solutions should be viewed in terms of so-called good practices whose implementation can and should act as a spur to attribute greater prominence to similar actions in other organizations.

2. Data and Methods

Empirical studies were conducted in the manufacturing company which aspires to the position of a leader in the industry of decorated crystal glass products in Poland. Due to the lack of consent to the publication of the company's name, it will be hereby referred to as "the Factory".

The company in question currently manages a brand which has been present in the world markets for over 200 years. The Factory functions as a branch of production and produces crystal glass blown and pressed. In order to fit with the needs of customers and the requirements of the community law governing the manufacture of articles that come in contact with food, the Factory has implemented Good Manufacturing Practices. The company has adopted a policy of quality whose aim is to acquire and maintain the position of a world leader in crystal glass production. The responsibilities of the Factory in relation to the quality of its products are implemented by fulfilling not only legal requirements, but also customer expectations in order to deliver a safe product.

The specificity of the Factory's production methods is currently an extremely niche industry in Poland. Production of hand-moulded and polished glass products, a traditional manufacturing technique and decorative design referring to the art of the nineteenth century allow for originality and open the way to a competitive market, winning numerous customers around the world. Nevertheless, the export of the Factory's products to foreign markets is burdened with the need to respect international technological requirements in terms of health safety of products intended for contact with food and the integration of socially responsible customer expectations. The traditional technique of production is also accompanied by the use of traditional materials, such as, among others, glass sand (SiO_2), potassium nitrate (KNO_3), calcined potash (K_2CO_3), antimony oxide (Sb_2O_3), and red lead (Pb_3O_4).

Considering the quality-oriented character of the research problem, the focus of the study was more on providing an in-depth insight into the problem than on the analysis of variables. This is likely to yield findings that can be merely suggested by qualitative examinations (Wójcik,

[2] In addition to the guidelines and standards listed above, it is important to mention the standard ISO 22000:2006, but also many regulations and laws, e.g. the law on liability for damage caused by a dangerous product or a regulation on the list of substances whose use is permitted in the manufacture or processing materials and articles intended to come into contact with food. For more information see. (Kijowski, 2008).

2013; in: Yin, 2009). It should be noted that researchers emphasize more and more often in the literature – e.g. findings presented by B. Flyvbjerg – that there are no generally-accepted theories with respect to human problems (especially food safety and CSR) (Flyvbjerg, 2005, p. 47). This author emphasized the benefits of using case study practices (case study methods). R. Yin also recommended employing case study methodologies to find answer to the question of why a particular phenomenon occurs (Yin, 2009, p.8).

Therefore, the description of an individual case study was employed in the study and the information was collected using the analysis of internal documentation, interviews and participant observation. Accordingly, data sources included an analysis of company documents created with regard to social responsibility through the implementation of Good Manufacturing Practice(GMP). Among the analyzed documents there was a Quality Manual, procedures and operational instructions, registers and forms to be used for the establishment of quality records, as well as results of laboratory tests confirming compliance with the standards of food safety.

In addition, the research process used participant observation. One of the co-authors of this study actively participated in the development of documentation necessary to develop and implement a quality management system that meets the requirements of Good Manufacturing Practices in relation to the studied company.

The research process also used informal interview with the representatives of the chief executives of the company, as well as the representatives of employees (a total of 126 people). In other words, there was used in-depth individual interview (IDI), i.e. a direct method of measuring the initial survey in which respondent is an active object of measurement, and where there is direct communication between the people selected for measurement and those carrying out said measurement (conversation) (Kaczmarczyk, 1999, p. 252). This kind of research, as established, allows for more in-depth knowledge and understanding of the analyzed issues.

The results presented here cannot be considered significant in statistical terms and should be treated in terms of an initial diagnosis for the discussed research issues and, at the same time, as has already been emphasized, as an example of good practices.

3. Results and Discussion

The Factory, being a manufacturer of products intended for contact with food (cups and glasses with coloured or clear crystal glass), with reference to the issue of food safety, shall be the subject of, in particular, the abovementioned requirements of the EU legislation, i.e. The Ordinance (EC) No. 1935/2004, and of the Commission's Regulation (EC) No. 2023/2006. It should be emphasized that in light of current legal situation in Poland there are no regulations which would refer to the requirements that should be met by glass products in the context of food health safety. However, the enterprise analysed in the study, guided by the sense of social responsibility for the health of their products' users, adopts other regulations *per analogiam* that are not compulsory i.e. they do not refer directly to the type of products manufactured in the Factory. In this respect, the enterprise implements guidelines contained in the Ordinance by the Minister of Health as of 15 August 2008 concerning the list of substances permitted to be used for manufacturing and processing of materials and products from materials other than plastics for contact with food (Journal of Laws 2008 No. 17, item 113), which refers to ceramic goods. Nevertheless, due to the similar category of glass and ceramic ware, including its raw material composition, the justness of using such solutions was adopted in the Factory, thus extending the formal legal order.

In connection with the requirements of these acts, the studied enterprise must meet the requirement of supplementing the materials and articles with a written declaration (i.e. the declaration of conformity) stating that they comply with the rules applicable to them. In order to demonstrate said compliance, adequate documentation should be available. The studied Factory fully complies with these formal requirements. Each product is supplemented with a written declaration certifying that the product meets the requirements included in relevant acts of law, standards and norms. At the same time, these declarations contains information about the compliance of the product with the quantitative limits of lead and cadmium.

An important element in ensuring health safety of customers - related to food safety - in the studied company is periodic testing of migration, which can be considered as one of the conditions for issuing the so-called declaration of conformity. It is particularly important to mark a specific migration assay in the scope of migration of cadmium and lead from the article of food (in this case lotions, alcohol, etc.). In order to determine the consistency with the standards expected for this type of products (glass), the requirements contained in the documents that extend current legal regulations due to the lack of a legal reference to health safety of glass products for contact with food are adopted:

- PN-EN 1388-1:2000 Materials and articles in contact with foodstuffs. Silicate surfaces. Determination of the release of lead and cadmium from ceramic ware.
- PN-EN 13882:2000 Materials and articles in contact with foodstuffs. Silicate surfaces. Determination of the release of lead and cadmium from silicate surfaces of p ceramic ware.

Although not required by Polish legal regulations, products manufactured in the Factory are subjected to tests regarding the designation of the specific migration of lead and cadmium with the frequency of once per every two years. The test results are documented. The analysis of shared documents allows to state that the Factory's products demonstrate compliance with the prescribed standards. According to the information obtained during interviews with the management and representatives of employees, the abovementioned measures are a sign of good manufacturing practices (GMP), which are - as already pointed out before – particularly required in the food industry. The abovementioned studies are also carried out at the request of the consumers of finished products.

Other initiatives that reach beyond current legal regulations (thus included in corporate social responsibility) were also observed. It was assumed that safe and hygienic work environment in the enterprises analysed in the study also affects health safety of products. Ensuring comfortable work environment is conducive to proper supervision of the technological processes and, consequently, maintaining its parameters in a manner that guarantees that strict standards concerning glass products for contact with foodstuffs are met. The measures were taken in the enterprise in order to avoid threats connected with working in the glass manufacturing industry. Work stations were equipped in facilities and safety systems e.g. noise-reducing chambers in the manufacturing part and air conditioning systems in rooms with high temperatures. It was adopted that the thermal comfort of employees in the Factory is the particularly important factor. Working conditions are monitored by the assigned employees and the results are audited by an independent external entity. Moreover, the decisions made in the Factory concerning the working environment are always consulted with trade unions and employee representations.

4. Conclusion

It should be emphasized that there are a number of the components in the enterprise analysed in the study that help improve health and life safety of products. These include e.g. evaluation

of cadmium and lead migration from the product to food or Good Manufacturing Practices which are so characteristic for food production. Consequently, meeting the requirements contained in legal regulations, including the acceptance of above-standard obligations in terms of health safety of glass products (that result from the lack of adequate regulations within Polish legislature) and social dialogue in the area of personal policy and safe working conditions (as a factor that supports adequate supervision of the technological process) are the manifestation of the implementation of the concept of corporate social responsibility (CSR) in the Factory.

The cited practices confirm that it is reasonable to accept the attitudes of organizations taking into account the operationalization of the CSR concept, especially in the context of the desired level of food safety. It is justified to state that the cases of enterprises that take measures to implement the CSR concept through exceeding current legal regulation e.g. due to the lack of adequate regulations or by using stricter requirements already imposed by current legal acts are valuable. It can be found that this understanding of corporate social responsibility is conducive to reduction in the business risk while these activities should be considered within the categories of taking civil liability for the damages that can be caused by the product to health and safety of consumers as final users. This leads to the presumption that the activities taken in this area should ensure the competitive advantage in the global market of crystal glass products.

The presented issues should be the subject of broader research and public debate, as the standards of social responsibility become a challenge for managers, especially when dealing with issues related to food safety, and therefore health of the customers. They should also be taken into consideration during formulation of specific solutions in other enterprises that operate in similar conditions of manufacturing of glass products for contact with foods. The example of the Factory presented in the study should be considered as an example of good practices. From the viewpoint of practical application, the investigations contained in this study can be used in order to popularize, among entrepreneurs, the examples of good practices aimed at ensuring food safety while implementing the CSR assumptions. This means rising the awareness of both employers and employees to search for non-standard approaches to the problem discussed.

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Improvement of regulation system and strategic planning of investment operations at meso level

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Abstract
The purpose of the paper is to improve regulation system of investment operations at meso level and the interconnection between the state and regions due to the formation of investment environment and intensification of investment operations as factors of social and economic orientation. The following methods are applied in the study: according to system approach the problem of planning and regulation of investment activities at meso level has been reduced to a series of clearly structured and interrelated tasks. Integrated approach provided information involvement from other branches of science, which have an influence on the theory and methodology of solutions concerning planning and regulation of investment activities at meso level. Results: the mechanism of investment activation based on effective investment policy at macro- and meso level using modern data-analysis tools. At the same time the regional investment policy should be aimed at the highest possible revelation of the territorial investment potential. The authors have developed recommendations to improve the system of planning and regulation of investment activities at the meso level, taking into account the necessity of logical stages, namely: analyzing, planning and prediction, organization, implementation, regulation, motivation, monitoring and results estimation. Organizational and methodological principles of formation stages and sequence of strategic investment planning at the meso level are improved. It is of practical importance for the authorities at macro- and meso level. Conclusions: it has been determined that to form objectives of regional investment policy as a starting point one should use the needs and interests of a region and that is why there should be a correspondence between final results of regional investment policy and interests of a region.

Keywords: *planning, regional investment policy, regulation, state investment policy, strategy*

JEL Classification: *G31, E62, L51, O29, R58*

1. Introduction

Formation of social and economic policy at meso level, that is, at regional one is a relatively new phenomenon, as a region is not sufficiently independent medium of social and economic relations and a participant of regional policy. Because of that regional investment policy is aimed at effective management of investment operations, but it is also closely connected with as well as it is the result of state investment policy. And because of this, it is important to investigate the interconnection between the state and regions due to the formation of investment environment and intensification of investment operations as factors of social and economic orientation. Regional policy as a modern mechanism of state administration in market conditions can be characterized by complex internal structure. Formation of effective investment policy at meso level influences not only on intensification of investment operations, but on social and economic development, improvement of living standards, creation of new

jobs, revealing of region potential as well as increase its competitiveness and intensification of innovative processes and so on.

Conceptual fundamentals of such investigated problems as attraction of investments, formation of investment policy, role of a state in the process of intensification of investment operations, investment interrelation with social and economic development are explained in main works of such scientists as K. Akamatsu, E. Berloy, L. Bakli, E. Brigham, R. Vernon, O. Williamson, D. Hoffman, X. Grey, J. Daninh, K. Iversen, J. Keynes, D. Kaddinhton, Ch. Kindleberher, K. Koji, R. Kouz, J. Odehnal, M. Sedlacik, J. Michalek, S. Magee, R. Mandell, A. Pigou, M. Porter, A. Ruhman, F. Ruth, P. Samuelson, T. Suon, O. Shkarupa, I. Burych, J. Tinberher, P. Fisher, S. Haymer, W. Sharpe and other.

2. Data and Methods

Theoretical and methodological background for this research is principles of Ukrainian and foreign economic science concerning regional development, regulation and strategic planning of investment activities at meso level. In order to carry out instructions of the study we used following methods: conceptual and logical, analysis and synthesis, system thinking.

3. Results and Discussion

Practice of working out of strategies of regional development, covenant and implementation of agreements as for regional development showed the following peculiarities and problems (Odehnal, J, Sedlacik, M., & Michalek, J., 2012; Shkarupa, O. V., & Burych, I. V., 2015; Shvets, V., Baranets, N., & Yefremova, F., 2012):

1) disadvantages of strategic planning of regional development;

2) conflicts between regional administrations, regional councils and groups of influence at regional level;

3) passiveness of central authorities as for the preparation and concluding agreements; duration of procedure of their development and concluding; dependence of this procedure on a political situation;

4) priority of concluding agreements for regions with high and medium;

5) direction of concluded agreements mostly to solving problems in housing and utilities;

6) different structure of funding sources of concluded agreements.

Over the last decades long-term and sustainability have become main principles of the development of countries. Eighty-two members of the United Nations (UN), it is 43 % of all countries in the world, in 2007 informed the Commission on Sustainable Development of the UN about the implementation of national strategies for sustainable development. Introduction of concepts of sustainable development and their formation are carried out not only on the basis of recommendations of the UN Commission on Sustainable Development, but using own development and improvement of some countries [1]. Let us consider stages of development and implementation of the strategy in Poznan and Krakow (fig. 1 and fig. 2). “The strategy of development of Poznan” ─ is a consolidated, structured list of approaches for sustainable city development focused on achievement of developed strategic objectives.

In methodological plan of the strategy of development of Poznan it is not mentioned when and where public research is conducted, but public consultation is one of the principles of the

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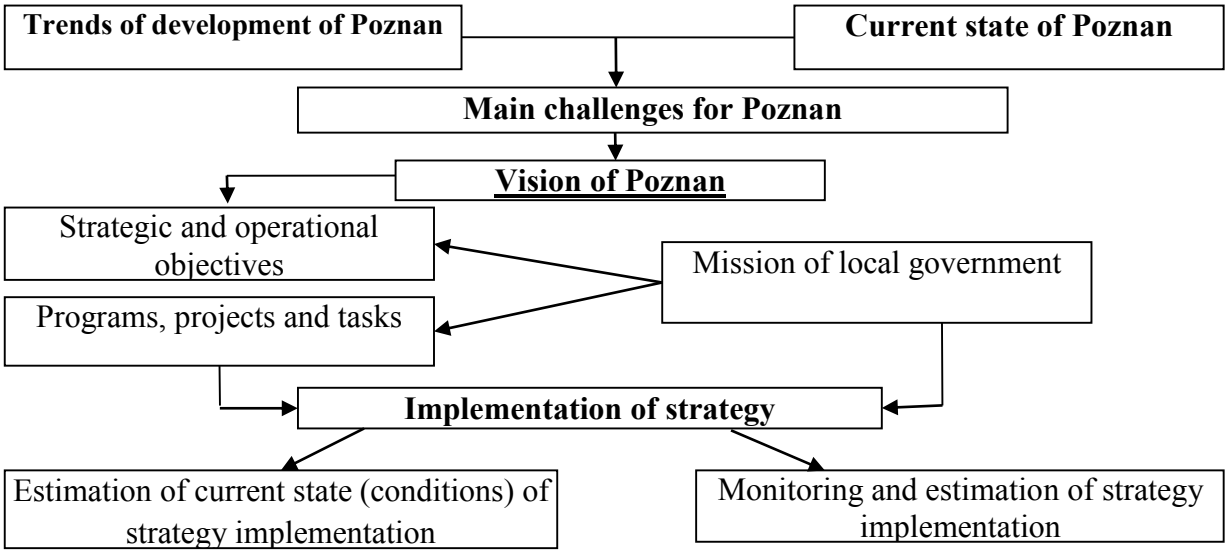
Strategy of city development. That is, working on the strategy the most views and wishes of the citizens of Poznan are taken into account.

Figure 1: Stages of development and implementation of the strategy in Poznan



Source: Worked out by the authors on the basis of the following resource [1]

Suggested methodological plan of Krakow (fig. 2) shows a classical approach to strategy formation of a city development, but in this methodology there is some innovation, namely, the creation of "Krakow list of opportunities". This document is a two-stage sociological research on opinions and judgments on the development of Krakow organized in a form of discussions among various social and professional groups and using traditional polling of residents. In general methodology of strategy formation of Krakow development is similar to the model that was shown in Poznan, but it is more extended and detailed ("Complex strategy of the development of Lviv for the period of 2012-2025", 2012).

Basis for agreement conclusion on regional development are strategies of regional development in accordance with legislation and coordinated with regulations of National Regional Development Strategy for the period up to 2015 ("National regional development strategies for the period up to 2015", 2010). As a basis of conclusion of such agreements there is the necessity of compulsory coordination of national and regional interests as for the development of territories as well as concentration and focusing of limited resources on priority development projects. This implies mutual responsibility of central and local authorities and local governments for the implementation of joint measures in the sphere of regional and local development. In general, a conclusion of agreements is aimed at ensuring stability in relations between central and regional authorities.

The experience of economic regulation of recent years clearly demonstrates the need to form two-level investment policy at national level, that is, at macro level and at meso level as well. Legal conditions for investments and factors supporting an increase of investment attractiveness of Ukraine should be formed at national level. Among investment attractiveness of Ukraine the most important one is tax burden reducing, providing economic and political stability and understandable determination of legal and regulatory framework of investment operations management. At regional level of investment policy it is necessary to create fundamentally new mechanism which would, on the one hand, correspond to peculiarity of Ukrainian society, and,

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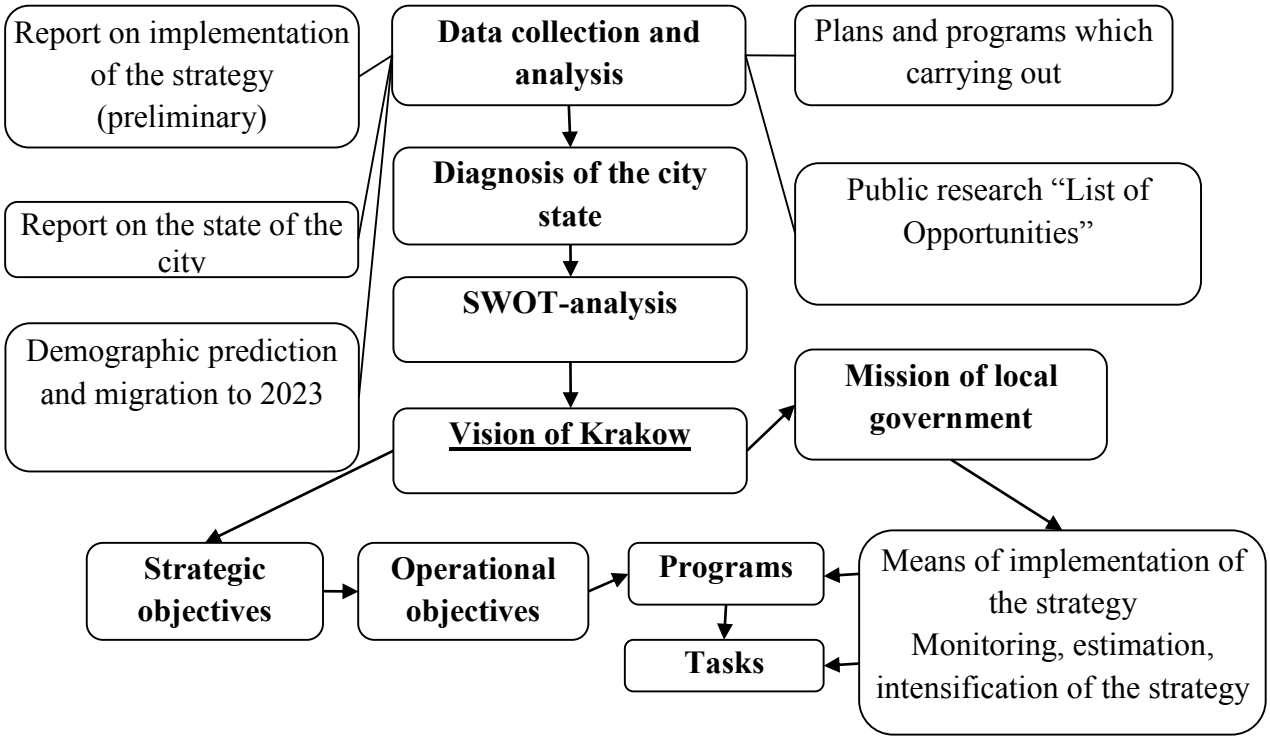
on the other hand - provide sufficient effectiveness of investment resources and intensify increase of investment flows within territorial and economic system of a region as well as beyond it ("Regional development strategies: ways to ensure effectiveness", 2011).

Figure 2. Stages of development and implementation of the strategy in Krakow



Source: Worked out by the authors on the basis of the following resource [1]

To form an effective mechanism of regulation of investment operations at meso level it is necessary to distinguish some principles, methods, functions, indicators, instruments because their changing directly dependents on specific conditions and stages of development of a region as well as on distinguished positions of social and economic development. But formation of such elements of mechanism of investment operations management in a region should be focused on the implementation and achievement of complex and specific objectives of social and economic development to meet the demands and improve the quality of life.

Investment policy at meso level ─ is an important block of regional policy, its foundation ─ a mechanism of intensification of investment operations using modern instruments. But regional investment policy should be focused on maximum consideration of specific regional factors of influence on investment operations and investing features. According to what was mentioned above there should be an adjustment of the state investment policy in accordance with regional characteristics. Moreover, priority spheres for the development and ways of implementation of investment policy should be defined at meso level.

An important criterion for the formation of investment regulation at meso level and the choice of instruments for regional investment policy is taking into account the possibility of objectives achievement in a quantitative dimension and the prediction of implementation effectiveness of determined measures. The main component of regional investment policy from the content point of view is its main objectives, depending directly on the objectives of state investment policy. That is why under regulation one can understand the determination of some peculiarities of regional development of areas, priority spheres of activities, some peculiarities of investment

operations, intensification of investment operations, creation of favourable image of a region as well as maximization of social impact earned from investing regional resources of different types, implementing innovative development and so on. Main objectives of investment policy at meso level can be determined in accordance with the development strategy of a region; they show a quantitative dimension of expected results, types and the nature of interrelation between participants. As it has already been mentioned, to achieve determined objectives, it is necessary to choose appropriate instruments and methods influencing the current situation of investment operations. And that is why it is advisable to create a regulation system of investment operations at meso level, which includes specific methods and instruments of planning and the regulation of regional investment policy. To prepare a regulation system of investment operations at meso level it is necessary to define ways of activities, impact, measures and instruments which will conform to them, taking into account appropriate objectives. The main factor as to the formation of objectives of regional investment policy should be aimed at solving top priority issues and barriers of carrying out investment operations. The content component of regional investment policy at meso level should be formed according to the demands and interests of a region.

D. Stechenko (2006) stresses that "regional interests are interests in constant reproduction and enhancement of social, natural, demographic, economic potential of a region. If this process is broken, the region sooner or later will go into the category of depressive ones, and it will experience a disaster with all social, economic, financial results. Any region can't get out from these conditions by itself. But in such conditions state support should be significant and consistent".

That is why final results of influence of regional investment policy on investment policy should reflect interests of a region. The main objectives, ways, measures and instruments as well as final results can be identified in strategic social and economic programs of a regional development and in concepts, recommendations and strategies, and so on.

Regulation of investment operations at meso level can be represented as a series of stages: analyzing, planning and prediction, organization, implementation, regulation, motivation, monitoring and results estimation.

At the first stage of analyzing, it is necessary to analyze current state of investment operations in a region and determine its initial parameters that will be the basis for comparison of changes and results.

The next stage is planning and prediction, which begins with setting objectives (aim) of investment policy at meso level. Objectives of investment policy are formed under the influence of social and economic demands of a region and should confirm regional interests, public interests and principles of investment policy. This step is a very important one because the development of a region's competitiveness and attractiveness for investors depends on right objectives of investment policy. On the basis of set objectives it is determined ways of influence, tasks, methods and instruments by means of which the policy will be implemented. Expected results are also formed which express the aim quantitatively and qualitatively. The next stage is the implementation of regional investment policy. The fourth stage consists of monitoring of implementation and achievement of tactical objectives as well as monitoring of changes of investment intensification. The last stage is results estimation that is, collection, analyzing and estimation of data characterizing the level of objectives achievement and the effectiveness of used measures. This stage can be of two types: the first is when set objectives are achieved, and the second ─ when set objectives are not achieved. When the second type of the stage has happened, it is necessary to diagnose causes of such situation and to identify problems and then to make a change in objectives or ways (directions), tasks, methods and

instruments of investment policy at meso level to achieve an effective progress in the process of investment intensification. Control system of regional regulation is to ensure the development of investing at a certain time in future, taking into account basic objectives, setting of proper tasks and choice of instruments for achievement of these objectives.

To achieve correspondence of expected results and received ones, in case if a set objective of investment policy is a real one, it is necessary to form proved system that assumes rational combination of using instruments and methods of regulation at international, national, sectoral and regional levels.

Local authorities should implement regional investment policy at local level. Regulation of investment processes development within certain cities (towns), districts, enterprises will contribute to sustainable development of a region in general. But it is necessary to provide close interconnection of all blocks (state, region, enterprise) and elements needed to create a single integrated system of adjusted regulation of investment policy. It would be better to form a feedback correlation between state, regional, city and district, village authorities as for problematic issues and ways of investment policy for social and economic development as well. All these things will help to ensure the effectiveness of measures of investment policy at macro and meso levels, which is its main aim. Instruments of state investment policy are as follows: depreciation policy, tax laws, monetary policy, stock market regulation, legal protection of rights and protection of investors, regulation of conditions for foreign investments.

N. Karmazina (2010) shares this opinion, believing that one should form effective interconnections forming investment policy at state and regional levels, taking into account specifics of a region, "the necessity of investment policy coordination at different levels of a hierarchy of national and regional management should be combined with specifics of certain regions and spheres because of different levels of their development, different investment needs and investment opportunities. Formation and implementation of investment policy at different levels of a hierarchy is a set of regulatory, institutional and methodological measures undertaken on the basis of purposeful and coordinated steps with public administration".

Thus, an interconnection of national and regional investment policy with investment operations on the basis of spheres and instruments of influence is highlighted.

As K. Starchenko (2011), N. Podolchak, I. Skvortsov and A. Tymeychuk (2015) point out, the analysis of working out experience of regional policy to attract FDI into Ukraine, Russia, Eastern and Western Europe shows that in most regions that have achieved a success in attracting foreign investment a strategic management is as a basis of investment policy development. In the sphere of investment the result of strategic management is, firstly, the concept of attracting investment, which includes the main aim, that is a sustainable development of a region, and a set of specific objectives, tasks and main ways of investment policy and secondly, a program of actions (it is a complex of connected activities, projects and programs that secure stage-by-stage achievement of these objectives, determined in the concept), and, thirdly, a plan of efficient control over implementation of programs.

In modern conditions of market economy, it is necessary for city development to form their development strategies. The reason of urgency of this issue is a progress and a success of strategic planning for cities in countries of the European Union.

4. Conclusions

The main conclusions of this research effort are as follows:

1. To form an effective mechanism of regulation of investment operations at meso level it is necessary to distinguish some principles, methods, functions, indicators, instruments because their changing directly dependents on specific conditions and stages of development of a region as well as on distinguished positions of social and economic development.

2. To achieve correspondence of expected results and received ones, in case if a set objective of investment policy is a real one, it is necessary to form proved system that assumes rational combination of using instruments and methods of regulation at international, national, sectoral and regional levels.

3. It has been determined that to form objectives of regional investment policy as a starting point one should use the needs and interests of a region and that is why there should be a correspondence between final results of regional investment policy and interests of a region.

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Evaluation management conflicts as an economic security approach

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Abstract
It has been elaborated the method for quantitative evaluation of level and structure of the interpersonal management conflicts that prevail over the other conflicts in the machine-building enterprises functioning. According to the reasons of appearance investigated interpersonal management conflicts were divided into the following types: informational, behavioral, structural, conflicts of relationships and values. The method was developed due to the usage of conjoint analysis that allows to evaluate simultaneously both the structure of the conflict and its level according to the priorities system, which has increased the credibility of gained results. Calculated values have shown that the prevailing conflicts in the structure of machine-building enterprises management conflict are informational ones that are related to poor information support of companies' administrators. The behavioral and relationship conflicts are also rather significant. They have different appearance nature and require special methods for their solution.

Key words: *conflict evaluation, conflict identification, interpersonal management conflicts, machine-building enterprise*

JEL Classification: *D74*

Introdaction

Dynamics of the environment, complexity of organization and communication structures, increase of the competition level, uncertainty in a number of market spheres, growth of the negative crisis outcomes, struggle between countries for markets and resources, active political confrontation especially in the developing countries are causing the general increase of conflicts quantity and conflicts levels. All the stated above factors of conflicts appearance lie beyond the limits of enterprises influence on them, which is why they require the constant monitoring and appropriate adjustment on the part of the organization. However, it is not less important to consider the subjective component of conflict appearance – lack of desire to see the mutual advantage of cooperation, possibility to avoid conflicts with minimal losses, confidence in the accuracy of ones objectives, principles and convictions, asymmetry and monocentricity of corporate culture, managers indifference towards the occurrence of conflict situations, which leads to irreversibility of negative effects and significant losses caused by conflicts activity.

Hereby the task for enterprises managers is to identify the potential conflict situations actively, sometimes to provoke their appearance in order to resolve the management problems, to evaluate their level, to influence their course and to try to receive functional results.

The problems of identification and quantitative evaluation of management conflicts in the enterprise functioning have been researched by both domestic and foreign scientists, including: A.J. Antsupov (2009), S.L. Boehm (1974), P.P. Gornostay (1997), S. Yerina (2002), H. Cornelius and C.Fair (1992), T.A. Polozova (2007), I. Sivchuk (2012), K. Smith (1993). All the methods of estimation process can be divided into usage of qualitative

evaluation criteria and quantitative identification indicators and into determination of the conflicts level.

An interesting method of conflict identification that is called mapping was suggested by Australian scientists H. Cornelius and S. Fair (Cornelius and Fair, 1992: 250-268). The key point of this technique consists in the development of identifying map that contains the following elements: the parties of conflict management, their needs and concerns. According to the authors of this method such maps are very effective in preparation for ensuring negotiations and business contacts, negotiations that have no logical development, resources allocation, avoiding of tension inside of the team and personnel risk (in particular staff turnover), implementation of innovations and changes etc.

S.I. Yerina has suggested diagnostic scale of management role conflicts. Designed by her approach makes it possible to identify and evaluate management conflict that arises in the work of lower level management (Yerina, 2002: P. 203- 207).

Another method has been developed by Russian psychologist Polozova T.A. to study relationships between team members, in particular to evaluate and identify interpersonal conflicts inside of certain administrative groups (Polozova, 2007). The method of A.Y. Antsupov "modular methods of interpersonal conflicts diagnosis" is similar to the previous one (Antsupov, 2009: 200-220). Except qualitative criteria Sivchuk I.I. has also proposed quantitative methods of conflicts identifying and measuring taking into consideration the corporate enterprise culture (Sivchuk, 2012].

While evaluating the level of conflicts it is essential to identify the structure within the complex of all management conflicts. To do this, a certain system and dominant features of homogeneous management conflicts structure formation have to be chosen. From the standpoint of an effective conflict management system construction it is very important to identify the root causes of conflict appearance, which will give an opportunity to develop a set of measures aimed at avoiding or reducing the dysfunctional effects of conflicts activity. Therefore, it is rather important to choose criterion that structure conflicts according to reasons and factors of appearance. Moreover, it is essential to elaborate specific quantitative indicators of conflicts structure detection and conflicts levels.

The research purpose is to develop the method of quantitative identification and evaluation of the interpersonal management conflicts structure and levels in the machine-building enterprises functioning by using modern economically statistical tools.

Methods – conjoint analysis

Data – Survey

Results and Discussion

Before the development of conflicts identification and evaluation methods the structure of the conflicts should be determined. Thus, in relation to appearance reasons Lincoln suggests dividing all kinds of conflicts into informational, behavioral, structural, conflicts of relations and values.

To identify and evaluate conflicts it was proposed to apply the method of conjoint analysis. Sequence of conjoint analysis usage is shown in Figure 1.

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Model for evaluation of the management conflict level and identification of its structure has the form (Malhotra, 2002):

$$K(x)=\sum_{i=1}^{m}\sum_{j=1}^{n_i} a_{ij} * x_{ij}\,, \qquad (1)$$

where K(x) – integral evaluation of management conflict level at the enterprise;

x_{ij} – evaluation of certain types of management conflict at the enterprise;

a_{ij} – parameter of the independent variable that corresponds to the *j*-th leve ($j \in \overline{1, n_i}$), *i*-th type of conflict;

n – number of evaluation levels;

m – number of management conflicts.

To receive at most adequate and credible results of the management conflict level evaluation all possible profiles combinations should be determined. In practice, however, the amount of all profiles is limited on the basis of detection of correlative connections between the profiles by using orthogonal method. In our research it is reasonable to evaluate 17 profiles that do not correlate with others; to be more specific, the correlation coefficient is minimal between the profiles (Table 1).

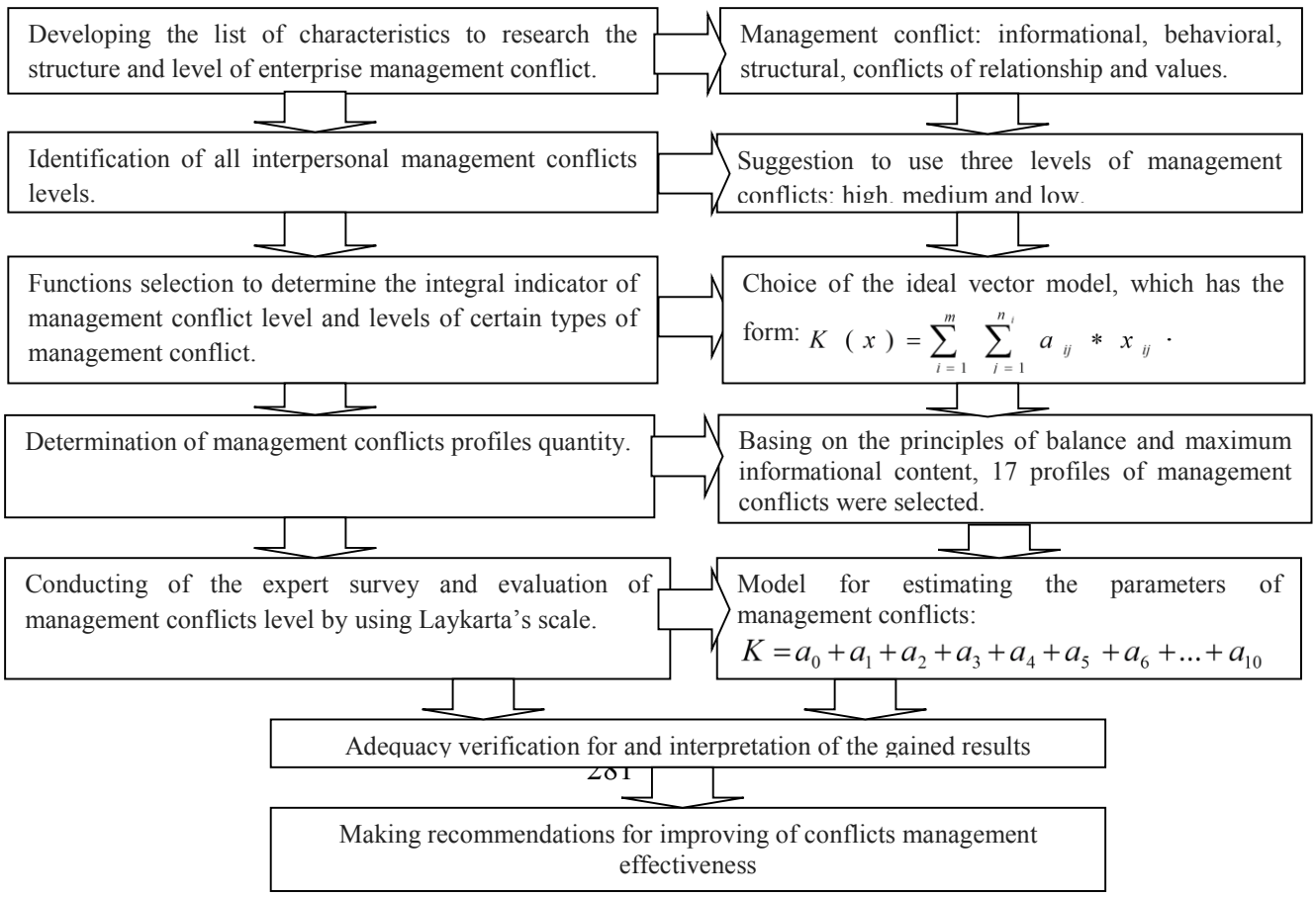
Based on the number of selected management conflicts and their levels, the formula for estimating the parameters will have the following form:

$$K=a_0+a_1x_1+.....+a_{10}x_{10}\,, \qquad (2)$$

where K – integral management conflict level indicator;

a_1-a_{10} – variables, different management conflicts of enterprises.

Figure 1: The sequence of conjoint analysis application to evaluate the level of interpersonal management conflicts



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Note: elaborated by authors

Practically, we create a common multifactorial correlative-regressive model with fictitious variables that take the value of either 0 or 1. Calculation of equation parameters is carried out by using the method of the least squares, where the respondents evaluation is the dependent variable and formed combinations of management conflict are independent variables.

Therefore the calculated model for the joint venture "Sferos Electron" has the following form:

$$K_1 = 3.32312 + 2.03231x_1 + 0.89795x_2 - 0.5493x_3 - 0.801x_4 + 0.21768x_5 - \\ - 0.1496x_6 - 0.1564x_7 - 0.3027x_8 - 0.3486x_9 - 0.4132x_{10} \quad (3)$$

Furthermore, having considered the input data of LLC “Robitnia”, it has been calculated the conjoint analysis models parameters for research of the interpersonal management conflicts structure and levels. The formula is the following:

$$K_2 = 2.48976 + 1.0536x_1 + 0.19196x_2 - 0.0138x_3 + 0.42215x_4 + 0.44828x_5 + \\ + 0.07998x_6 - 0.215x_7 - 0.3859x_8 - 0.389x_9 - 0.0354x_{10} \quad (4)$$

Table1: An average value of interpersonal management conflicts profiles evaluation at the machine-building enterprises

The average level of conflicts at the enterprises		Profiles of interpersonal management conflicts									
		Informational		Behavioral		Relationship		Values		Structural	
JV "Sferos Elektron"	LLC "Robitnia"	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
2	2.25	0	0	0	1	0	0	0	1	0	1
1.714286	2.375	0	0	1	0	0	1	0	1	0	1
2	3.375	0	0	0	1	1	0	0	1	0	1
3.142857	2.875	0	1	1	0	0	1	1	0	0	0
3.428571	2.875	0	1	0	1	1	0	1	0	0	0
2.714286	2.875	0	1	1	1	0	0	1	0	0	0
3.714286	3.5	1	0	0	1	1	0	1	0	1	0
4.571429	2.625	1	0	1	0	0	1	1	0	1	0
3.714286	3.5	1	0	0	1	0	0	1	0	1	0
2.571429	2.5	0	0	1	0	1	0	0	1	0	0
2	2.375	0	0	0	1	1	0	0	1	0	1
3	2.625	0	1	1	0	0	1	1	0	0	1
2.714286	2.25	0	1	0	1	0	1	1	0	1	0
4.142857	3.75	1	0	0	1	0	0	0	1	1	0
4.428571	2.75	1	0	1	0	0	0	0	1	0	0
3	2.875	0	0	1	0	1	0	1	0	0	0
3.142857	2	0	1	1	0	0	0	1	0	1	0

NOTE: generated on the basis of expert surveys

The received regressive models contain only the values of 10 levels of different management conflicts types. Therefore, we should find the values of the other 5 levels of management conflicts and identify the prevailing management conflicts in the structure of conflicts that arise in the machine-building enterprises functioning (Table 2).

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Table 2: Characteristics of interpersonal management conflicts levels and partial weight of these levels

Management conflicts	Levels	Partial weights	
		JV "Sferos Elektron"	LLC "Robitnia"
Informational conflicts	High	1.05556	0.638464
	Medium	-0.07879	-0.223236
	Low	-0.97676	-0.4152
Behavioral conflicts	High	-0.09914	-0.149958
	Medium	-0.35085	0.286056
	Low	0.45017	-0.136098
Relationship conflicts	High	0.195012	0.27219
	Medium	-0.172335	-0.096105
	Low	-0.022675	-0.17609
Values conflicts	High	-0.0034	-0.0147
	Medium	-0.14964	-0.18563
	Low	0.15306	0.20033
Structural conflicts	High	-0.09467	-0.24755
	Medium	-0.1593	0.10605
	Low	0.25397	0.14149

Note: calculated by authors

Having applied the formulae for determining the fixed weight of management conflicts in the overall structure of interpersonal conflict at the machine-building enterprises, we have got the results which are settled up in Table 3.

Table 3: Results of the fixed weight of management conflicts

Management conflicts	Relative fixed weights of management conflicts		Interpretation of received results	
	JV "Sferos Elektron"	LLC "Robitnia"	JV "Sferos Elektron"	LLC "Robitnia"
Informational conflicts	1	1	The most significant conflict	The most significant conflict
Behavioral conflicts	0.28811	0.074964	The second place in terms of conflict significance	The third place in terms of conflict significance
Relationship conflicts	0.184899	0.093335	The third place in terms of conflict significance	The second place in terms of conflict significance
Values conflicts	0	0	The least significant conflict	The least significant conflict
Structural conflicts	0.063927	0.004613	The forth place in terms of conflict significance	The forth place in terms of conflict significance

Note: calculated by authors on the basis of conjoint analysis

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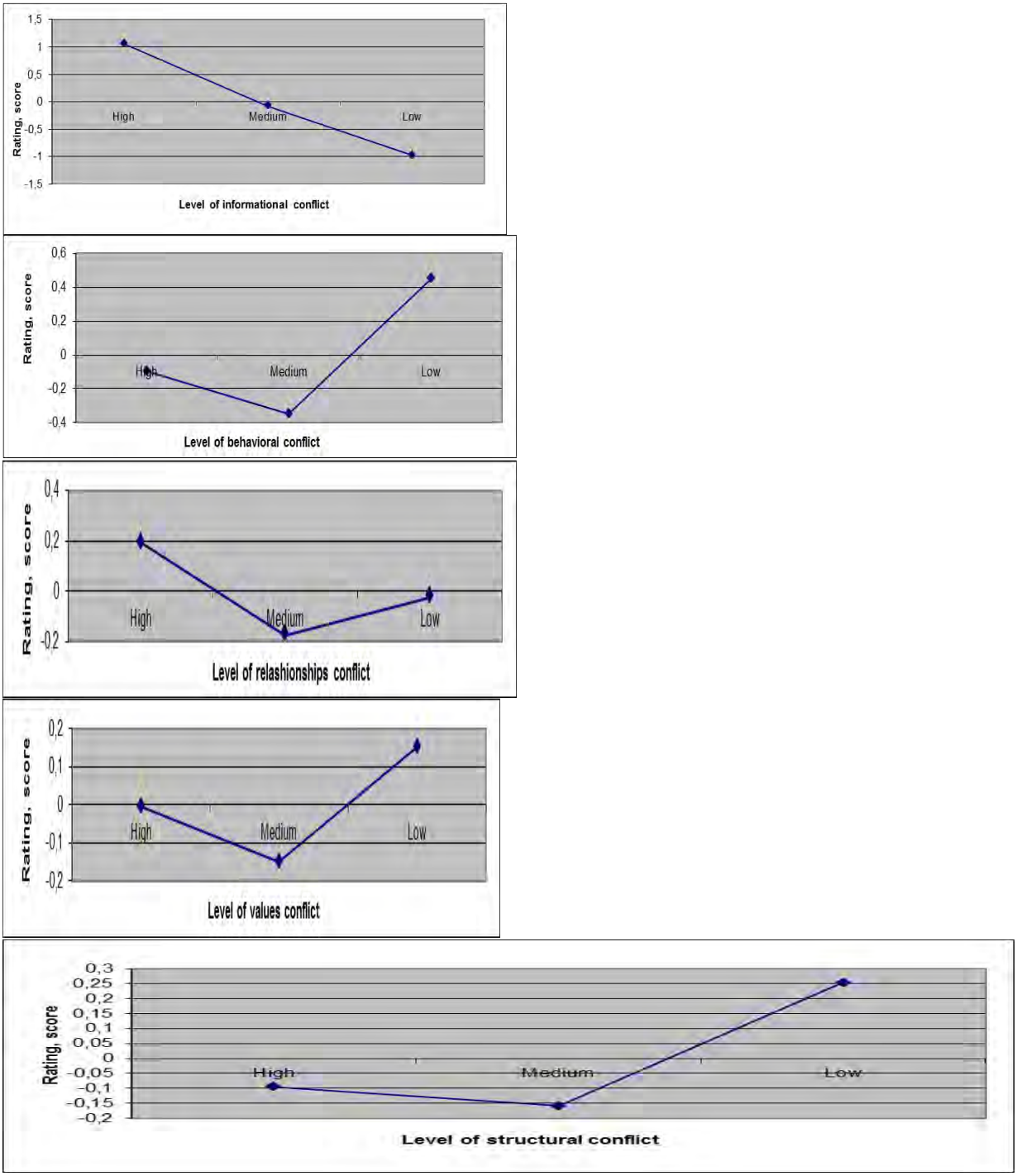
In order to interpret management conflict patterns at the machine-building enterprises appropriate graphs have been formed (Fig. 2 and Fig. 3).

Figure 2: The structure and level of management conflicts in the functioning of JV "Sferos Electron"



Note: elaborated by authors using the conjoint analysis method

Conclusion

The structure of management conflicts in the functioning of machine-building companies is quite similar. The research has made it possible to detect that in the structure of management conflict the dominant ones are informational conflicts that are related to poor information support of companies' administrators. Hereby the level of informational conflicts is rather

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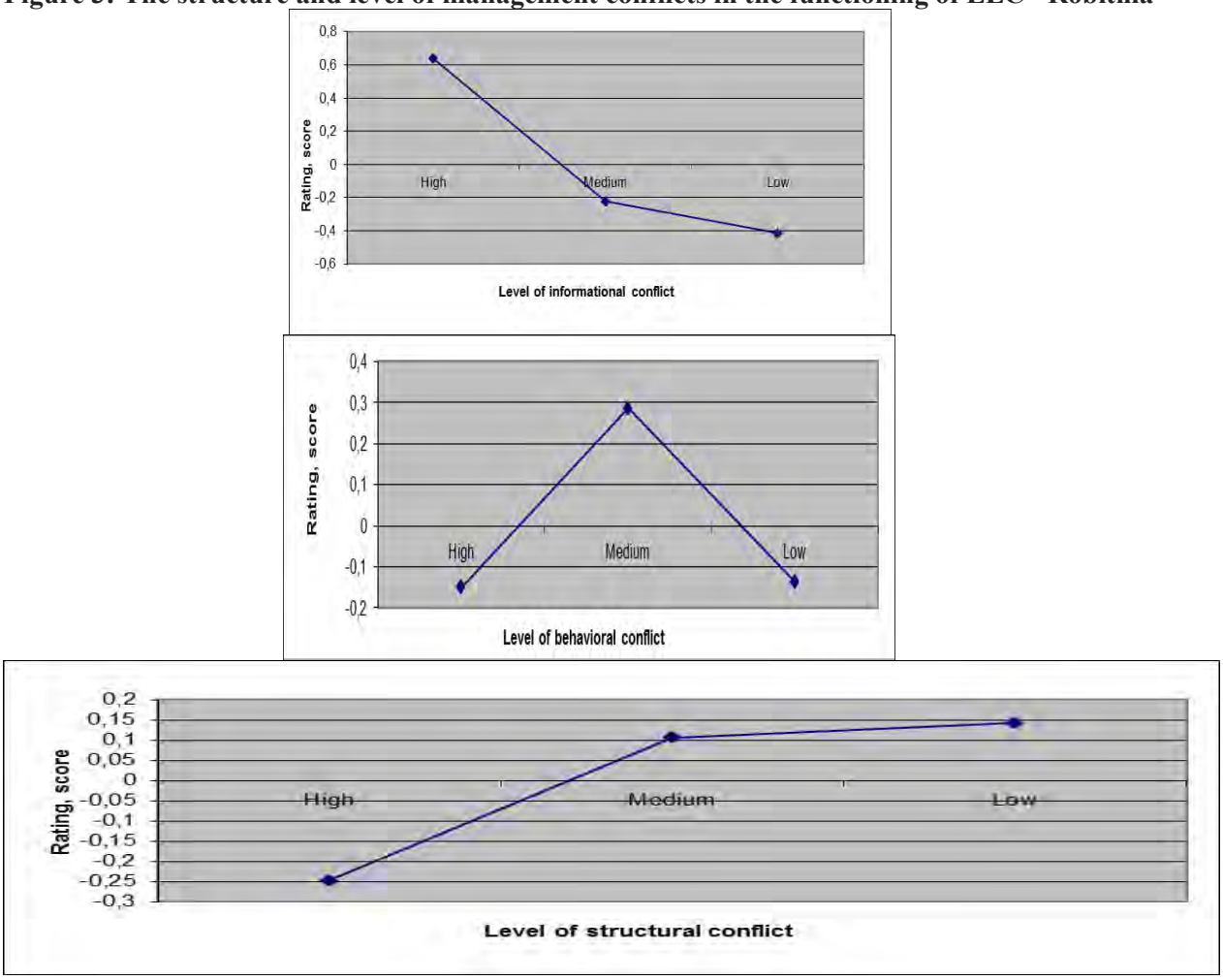
significant. Experts draw attention especially to the unsatisfactory level of information support of management decision-making process, lack of information about changes in the environment, asymmetry of information in the various stakeholder groups. Therefore, the main recommendation for elimination of the conflict's dysfunctional consequences for the company is the necessity to direct resources at the improvement of communication channels and to take measures regarding the management decision–making process information support development.

Figure 3: The structure and level of management conflicts in the functioning of LLC "Robitnia"



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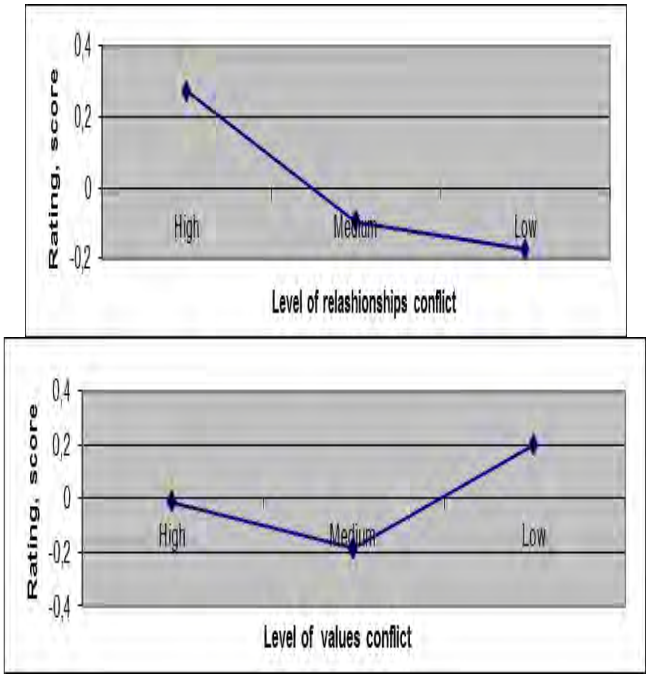

Note: elaborated by authors

For the functioning of the JV "Sferos Electron" behavioral management conflicts are rather essential. The main reasons for their occurrence at the investigated enterprise are dominance of private arrangements, nepotism, active influence of informal organizations that sometimes can prevail over rationality and efficiency in management decision-making. The settlement of such conflicts is possible by implementing definite standards of behavior and decision-making process and absolute adherence of those standards.

For the LLC “Robitnia" on the second place in terms of significance in the structure of the enterprise management conflict there are relationships conflicts that display a high level of dynamism and, thus, bring turbulence and uncertainty into the activities of administrative management subsystem. According to the experts, the reason for the appearance and dominance of behavioral conflicts in the enterprises functioning is the lack of power balance in the relationships between the leaders.

As for the JV "Sferos electron", the management conflict of relationships takes only the third place in terms of significance. Interestingly, the level of relationships conflict is as high as for the previous enterprise. Consequently, both companies should take measures to improve the relationships between managers by developing corporate unity programs.

In the third place in terms of dominance in the structure of general management conflict at the "Robitnia" enterprise there are behavioral conflicts, while structural conflicts take the penultimate place. In addition, it was discovered that the level of all structural conflicts that occur in both mentioned above companies is quite low. Thus, the objective circumstances of conflicts appearance that cannot be changed are not significant in terms of conflicts occurrence. In the structure of the management conflict in the functioning of both companies the least important one is the conflict of values.

Further research should be focused on developing result-based methods that would help to reduce and avoid interpersonal management conflicts in the machine-building enterprises functioning.

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Parallels between corporate social responsibility and safety culture

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Abstract
Corporate Social Responsibility is a modern business concept, which takes into consideration not only economic interests of a business subject, but also social and ethical questions. A well defined safety culture, which relies on company's culture, helps organizations to successfully fulfill conditions, which socially responsible businesses are faced with. The article outlines individual factors that influence the character or social and ethical responsibility of an organization, while the main focus is on responsibility towards an organization's employees. The conclusion identifies parallels, common signs, which connect both phenomena - social responsibility and safety culture.

Key words: *Business, Corporate Social Responsibility, Safety Culture*

JEL Classification: *M21, J280, K320,*

1. Introduction

Negative factors in today's business environment are enormous pressure to continually increase productivity, pressure from competitors to decrease expenses, as well as increasing globalization. One possible solution unfortunately becomes saving on employees, on safety, on environmental processes, and others.

As a reaction to negative factors in business practices, several recommendations and examples of companies' ethical processes have surfaced in recent years. These should focus internally (mainly towards its employees), but also externally, towards their outside environment. Corporate Social Responsibility (CSR), specifically Social Accountability (SA), is a specific segment of management that focuses on improving ethical behavior of organizations inward and outward. The European Union outlines CSR as voluntary integration of social and ecological outlooks into company's everyday operations and interactions with stakeholders (European Commission, 2011). According to the World Business Council for Sustainable Development, CSR presents company's continuous commitment to act ethically, to contribute to economically sustainable growth, and to carry out improvement of quality of life of its employees and their families, as well as the local community and the society as a whole (Alhouti et al., 2016).

Developed and forward thinking organizations aim to provide care for their employees and work safety beyond set legislative regulations, by implementing voluntary work safety management and by implementing a safety culture as part of their corporate culture. They declare interest in their employees and in a pleasant work environment as a priority. They understand that a person's quality of life depends, among other factors, also on specific work that the employee performs and on work conditions where the work is being performed (Nielsen, 2013). In relation to this, it is important to realize that expenses on health issues that result from performing work are extremely

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high. Studies from some EU countries indicated that such incurred economic losses reach between 3-5 % of gross domestic product and final economic losses can even be higher if we take into consideration shortening of productive work life due to illness or passing of highly productive employees.

The aim of the article is to show common elements and interconnectedness between safety culture and corporate social responsibility, to find common parallels of these existing phenomena, which strive for the same goal, to improve corporate processes in a competitive environment.

2. Characteristics and Principles of Corporate Social Responsibility

Since Corporate Social Responsibility (CSR) is becoming an important factor of company's competitiveness in today's corporate world, business subjects need to strive to continuously improve their CSR standards. The European Union considers it its priority to enforce ideas of this concept, as a result, ideas related to implementation of CSR principles gain importance.

Carroll (1999) briefly characterizes socially responsible business as company's continuous commitment to act ethically. CSR can be understood as company's voluntary commitment to act responsibly toward the organization and the environment in which it conducts business, while performing its activities (Habek, Wolniak, 2015).

We can specify seven typical signs of the CSR concept based on many definitions and characteristics of corporate social responsibility (Fig. 1):

1. **Principal of voluntary involvement** – companies with corporate social responsibility voluntarily embark on activities and accept commitments, which are not within the scope of their responsibility as determined by legislative regulations. Therefore, they are not forced to act this way by law, but act based on company's beliefs.
2. **Active cooperation** and open dialogue with all interested parties – this commitment goes beyond the traditional requirement that a company should act responsibly toward its shareholders. It encompasses other stakeholders, whether employees, suppliers or local communities. An important component is also cooperation with the not-for- profit sector and the government, often with the aim to improve the company's status quo and to resolve important social problems.
3. **Company's engagement** – companies with corporate social responsibility, which create new positive trends in a company, already include CSR into their company's strategies and take them into consideration when creating corporate values and goals.
4. **Systematic approach and long-term time horizon** – corporate social responsibility is a long-term commitment. CSR should become part of strategic planning, of continuous checks, and evaluation of companies.
5. **Credibility** – only credible corporate social responsibility will allow a company to fully take advantage of benefits that implementation of CSR principals brings. They identified four main conditions for achieving credibility in the eyes of the public: personality, authenticity, transparency, and importance.
6. **Company's activities with regard to the so called triple – bottom – line business** – corporate social responsibility is a modern business concept, which stands on three pillars (economic, social, and environmental). For this reason, it emphasizes as one of its main

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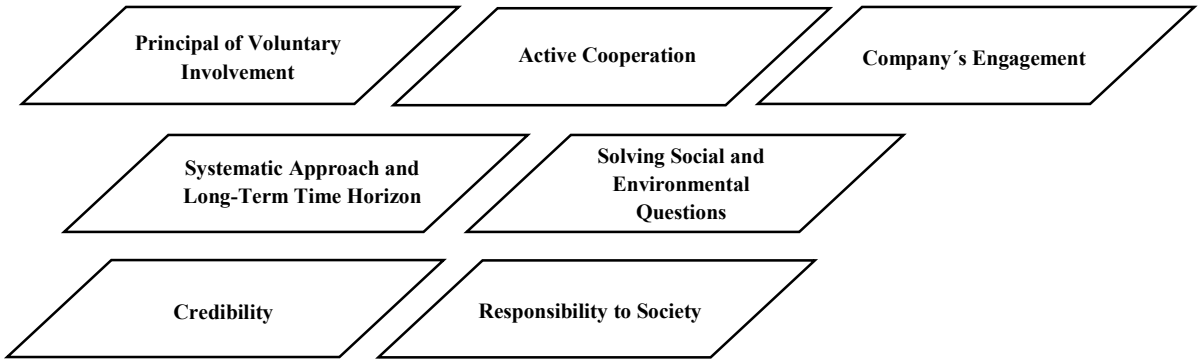
ideas that companies should aim to not only maximize their profit and economic growth, but also focus their attention on solving social and environmental questions.

7. **Responsibility to society** is company's commitment to contribute to improvement of people's lives. Social responsibility consists of ethical imperatives to work for the benefit of the society. All themes and activities fall under this fairly broad concept, whether it is conception, protection of the environment or fight against abuse and discrimination of employees. They are characterized by contribution to health of the society around the organization and of society as a whole. (Kunz, 2012).

Figure 1. Seven Signs of the Corporate Social Responsibility Concept in Business



Source: Sujová, based on Kunz, 2012

Corporate Social Responsibility requires a shift in approach from focusing on company's profits to focusing on a view that will allow it to understand business in a broader system of social and ecological relationships (Kotler, Lee, 2005). According to the above stated, in this article the term corporate social responsibility is understood as monitoring and improvement of processes through which an organization contributes to development of the economic environment and its aspiration to minimize negative impacts of its activities. A socially responsible business appeals to a change in orientation of organization from short-term to long-term goals, from maximum to optimal profit (Horska et al., 2011). Socially responsible organizations act so as to keep in mind requirements of the internal and external environment, to contribute to sustainable development, and to remain transparent, so that they can contribute to overall improvement of the society. In practice, Corporate Social Responsibility is seen as integration of positive attitudes, practices or programs into strategies of a business subject at the upper management level. To act in accordance with the social responsibility principles brings a business subject many advantages and benefits, especially non-financial ones. They also play an important role in good and long-term sustainable operation of an organization (Čierna, 2008).

3. Specific Features of Safety Culture and Management of Occupational Health and Safety (OHS)

Occupational health and safety were in the past based only on legislative rules and regulations, of strict safety requirements, mainly technical. However, it was study of management systems that

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revealed a way how to continuously improve it by measures in work organization, by solving specific situations at a workplace, and by implementing system regulations. Implementation of an OHS management system in an organization should be seen as a tool for improvement of efficiency of work organization and optimization of the work process. An ability to continuously maintain functioning of a system is a unique factor of a company and its productivity. Even though it is true that implementation of an OHS management system needs to remain voluntary, there are legislative regulations that impose obligations to implement some measures, which are also elements of the OHS management system (Sujová, 2013). In terms or managing activities, an organization's management has direct responsibility for activities that fall under the umbrella of OHS, such as protection of the environment, safe production and maintenance, safety of manufactured products, as well as offered services in accordance with relevant legislative regulations. Upper management directly influences corporate culture and creates conditions for implementing of safety culture in an organization (Schwarz et al., 2013). The consequence of successfully implementing attributes of safety culture in an organization is applied in the following principles:

- OHS needs to be included in organization's development strategy;
- prevention has to be priority and it has to be included in the complex of organization's management activities;
- responsibility within the scope of OHS tasks cannot be delegated and must be part of upper management's activities;
- life and health of colleagues take priority over other decisions taken by the organization;
- the OHS management system must also include measures for "third" parties;
- focus needs to be on minimizing harm for humans and material damage;
- OHS must be a priority within the scope of all technical and non-technical processes of an organization;
- every employee is required to adhere to regulations and measures that result from the OHS management system;
- create conditions for continuous improvement of OHS systems and for efficiency (Sinaj, 2009).

Above indicated characteristics for increase of efficiency of OHS management should become part of organization's corporate culture. By including these informally and organically into values, norms, and organizational measures of an organization, they can be a motivation to approach OHS, to prevent work injuries, and other unwanted incidents.

4. Attributes and Measures of Safety Culture

Safety culture can be defined as summary of processes and personal approaches in an organization and thinking of people that ensures that problems in the organization are given appropriate priority, correlated to their importance.

Safety culture in itself is:

- a sum of adopted ideals of social behavior, beliefs and thinking of a given community in relation to safe activities;

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- an element affecting all aspects of organization's activities;
- organic part of corporate culture.

When defining safety culture, five basic, characteristic, attributes were identified (Fig. 2):

- all employees (including employees on the front lines and administrative staff) accept responsibility for their own safety, safety of their colleagues and safety of interested third parties;
- gives preference to safety over financial and production goals;
- supports identification, communication, and resolution of safety related questions;
- ensures that all can learn from unwanted events affecting safety;
- provides appropriated resources, structures, and responsibility to ensure effective safety systems.

Figure 2. Attributes of Safety Culture

Source: Sujová

By developing basic attributes of safety culture in organizations, we can improve processes and rules necessary for ensuring safety. It is imperative that all employees adopt the stated principles as their own, follow them continuously, and improve processes to attain these principles.

To improve processes and to create a favorably safety environment, the following basic principles of safety culture, which can be divided into three categories (Table 1), contribute. These are safety, people, and work conditions.

The current approach to safety culture is based on the view that safety culture is equivalent to conscientious culture and corporate social responsibility of organizations, where organizations actively focus on an individual within a work process, on organizational and technical questions, on environmental questions in the context of the work place and the environment, as well as on protection of natural resources.

Table 1 Basic Principals of Safety Culture

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Area	Breakdown of Principals for a Given Area
Safety	• safety is a high priority • self-evaluation and measuring indicators of safety performance • attitude that safety can always be improved • quality of documentation and processes • alignment with regulations and processes
People	• managers‘ behavior; relationships between managers and employees • clearly defined tasks, powers, and responsibilities • motivation and satisfaction at work • inclusion of all employees • collaboration and team work • conflict resolution • open approach and communication • willingness to learn from better performers
Work Conditions	• optimal work conditions • appropriate material and technical resources • machine, equipment, and building maintenance • taking care of the work place and the environment • protection of natural resources

Source: Sujová

4. Identification of Parallels between Social Responsibility and Safety Culture

Based on the above indicated analysis, we have identified the following common attributes of both phenomena (Fig. 3):

- they are an inseparable part of corporate culture;
- they are based on voluntary performance;
- their implementation leads to improvement of corporate processes;
- they are mainly focused on an organization’s employees;
- they are performed and promoted by organizations‘ managers;
- they require frequent and effective communication within organizations‘ organizational structures;
- their implementation and declared fulfillment increases organization’s overall value in the public’s eyes and thereby creates competitive advantage in comparison to subjects that have not implemented such systems.

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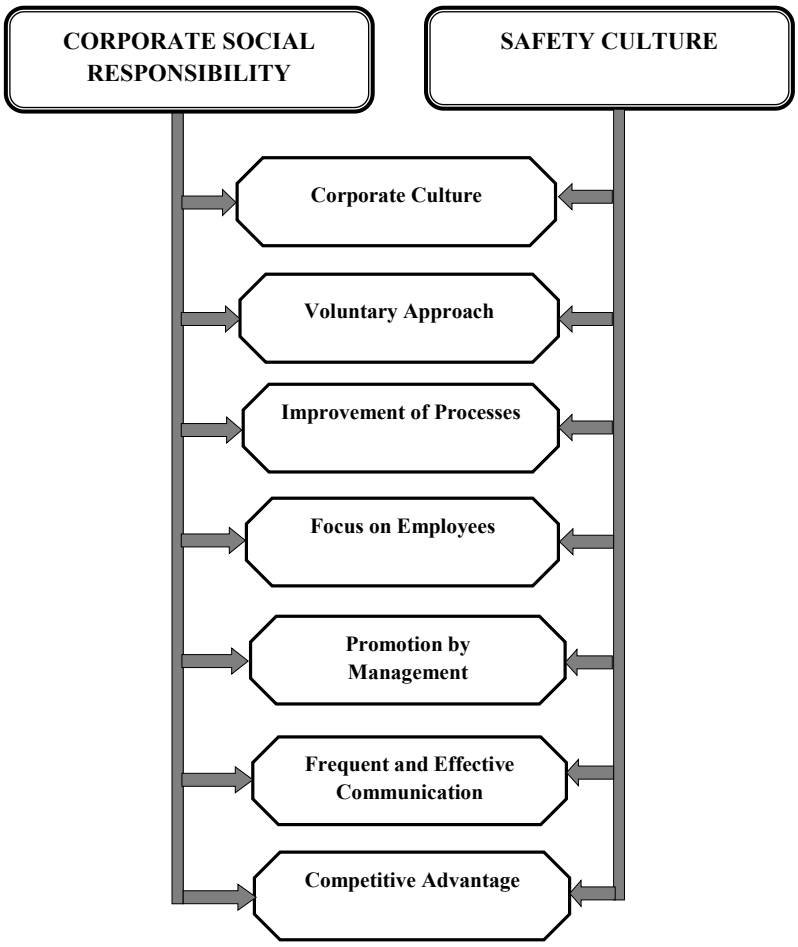
Figure 3 Parallels between Corporate Responsibility and Safety Culture



Source: Sujová

Conclusion

The object of the article was to define basic attributes of safety culture and to find interconnectedness with elements of socially responsible business, a new phenomenon for increasing organizations 'competitive advantage. Level of safety culture is a dimension that cannot be directly or exactly measured. Despite this, it has an important influence on organizations' employees, style of management, and level of technology. Measures of safe work and an overall feeling of safety at workplace, without prediction of illnesses caused by work or the threat of a work accident, create a calm work atmosphere and stimulate employees. In conclusion, we can state that adhering to principals of social responsibility conditions creation of processes of developed corporate culture, since requirements for both systems in many ways intertwine and complete each other.

Acknowledgement

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Corporate social responsibility as an aspect of business ethics in selected Slovak companies

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Abstract
Social responsibility and business ethics are often regarded as the same concepts. On the other side, business theory as well as company practice confirms that the social responsibility movement is just an aspect of the overall discipline of business ethics. Business ethics, also named Corporate Ethics, is the concept which has come to mean various things to various people. Nowadays, both these concepts are slowly penetrating into the consciousness of the lay and professional public in Slovakia. This article is based on the single part of mentioned research related with the problem of business ethics. This consist of three main research questions. At the beginning we examined if surveyed companies have prepared an Ethical Code or the Code of Conduct and if they implement this in business practice. Second question assayed if ethical behavior helps enterprises to achieve business objectives and the third question deals with the problem if company favors business partners who prefer similar corporate values and business. The publication of this article is supported by the Slovak Scientific Agency VEGA - Project VEGA No. 1/0044/13 "Corporate Social Responsibility (CSR) of the Slovak Enterprises in the context of Internationalization in Business". The main objective of this project is to assess the level of corporate social responsibility in Slovakia in the context of the internationalization of business and identify factors that affect their socially responsible behavior in a competitive environment. In this article we deal with the surveyed sample of the 58 trade companies (and cooperatives) from different districts of Slovakia. Most of them were established after 1994 and more than a half of them belonged to the category of "small and medium sized enterprises"– SMEs. Survey involved companies from fifteen industries according to NACE classification.

Keywords: *Business Ethics, Corporate Ethics, Corporate Social Responsibility, Slovakia, Ethical Code, the Code of Conduct*

JEL Classification: *M12, M14*

1. Introduction

Social responsibility and business ethics are often regarded as the same concepts. On the other side, business theory as well as business practice confirms that the social responsibility movement is just an aspect of the overall discipline of business ethics. Business ethics, also named Corporate Ethics is the concept which has come to mean various things to various people, but generally it is coming to mean what is right or wrong in the workplace and doing what is right. The concept of social responsibility arose particularly during the 1960s with increased public consciousness about the role of business in helping to cultivate and maintain highly ethical practices in business. Philosophers consider ethics to be the "science of conduct" and corporate social responsibility (CSR) as "corporate citizenship". The concepts of CSR and Business Ethics should be incorporated in the vision, strategy, and corporate culture. A strong corporate culture is reflected in the values and principles of the company, is increasing employees´ loyalty and has a positive impact on the external environment of the company. An institutionalization of these concepts can be applied through various corporate documents and management systems: the Code of Conduct, Total Quality Management, Environmental Management, etc. Venture through the concept of CSR declares that company

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cares for all stakeholders. Ethics refers to the moral rights and wrongs of any decision a business makes. Both these concepts are now slowly penetrating into the consciousness of the lay and professional public in Slovakia.

Is Corporate Social Responsibility the Same Concept as Business Ethics?

CSR has become very essential aspect for the companies, although debates about the roles of business in society is really ancient issue. (Gray et al., 1996; Warren, 2003) According to Ubrežiová et al. (2013, p. 1), CSR *"has become part of daily business activities more than before"*. However, there exist many terms and concepts that describe the relation between business and society and are often used interchangeably with CSR, such as Business Ethics or Corporate Philanthropy. (Sawfat, 2015) Still, there is no definition of CSR that is accepted generally. (McWilliams et al., 2006) According to Amaeshi and Adi (2007), several authors consider CSR as concept that is fuzzy and unclear, in spite of its successful gauge. However, the amount of definitions and paper discussing the concept of CSR have been emerging. (Okoey, 2009)

The concept of CSR is also considered as very important part of corporate strategy (Elkington, 1998; Porter and Kramer, 2006; The Economist, 2005), what helps the companies to uphold their position in the market – by *"integrating the public interest and concern into business planning and decision making"*. (Udomkit, 2013)

When speaking about CSR and business ethics, it is very common that these two concepts overlap and sometimes are being used interchangeably in the academic literature. (Cacioppe et al., 2008; Fassin et al., 2011; Ferrell, 2004; Vogel, 1991) On one hand, they are considered as distinctive concepts, with distinctive identities, as stated by Goel and Ramathan (2014). On the other hand, concern for ethical issue is what they have in common. (Cacioppe et al., 2008) Following Dimitriades (2007), business ethics as a term is supposed to be *"a combination of two very familiar words, namely business and ethics"*. (Dimitriades, 2007, p. 1) CSR have become to be understood as part of ethical and responsible way of doing the business for long time as many definitions suggest. For example, World Business Council for Sustainable Development define CSR as *"ethical behavior of a company towards society"*. (World Business Council for Sustainable Development, 1999). Very used is also the definition by Carroll (1998) who described CSR by the use of pyramid structure and divided it into four overlapping dimensions – economic, legal, ethical and philanthropic. Hopkins (2004), as well, used the relation of CSR in his definition, where he connects CSR with *"treating the stakeholder of the firm ethically or in a socially responsible manner"*. (Hopkins, 2004, p. 1) As mentioned above, ethical orientation is also part of CSR (Carroll, 1998) what makes the society think it is the synonym to business ethics. (Barret, 2009)

CSR and its Connection to Codes of Conduct

Currently, a lot of organizations have created so called Codes of Conduct/Ethics. (Miller, 2004). However, finding the definition of such Codes in the CSR literature is very challenging. There exist many various definitions, but on the other hand, they are very similar indeed, as they contain common aspects – such as their voluntariness, their use to influence behavior of certain group, self-regulatory nature, etc. (Kaptein and Wempe, 2002; Kolk et al., 1999; OECD 2001; United States Council for International Business, 2000) Very good example of such definition is offered by United States Council for International Business, which defines the codes as *"commitments voluntarily made by companies, associations, or other organizations that put forth standards and principles of business conduct in the marketplace, and are thus primarily market-driven"*. (United States Council for International Business, 2000, p. 2). On one hand, the document discusses several CSR-related issues including environment and its protection, human rights and describes initiatives of other

organizations, such us UN Global Compact/Guidelines for CSR or the ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy. On the other hand, there is no suggestion or notion that Codes of Conduct are primarily a tool of CSR. Other authors and organizations defined codes and did not connect them directly with the CSR as well although they discussed codes and CSR issues. (Bondy et al., 2006) However, some authors made the implicit relations explicit. To demonstrate this case, it is possible to use the definition of Kolk et al. (1999) says that codes of conduct are *"encompassing guidelines, recommendations or rules issued by entities within society (adopting body or actor) with the intent to affect the behavior of (international) business entities (target) within society in order to enhance corporate responsibility".* (Kolk et al., 1999, p. 151)

2. Data and Methods

Article is based on the single part of extensive research conducted within research grant project VEGA no. 1/0044/13 "Corporate Social Responsibility (CSR) of the Slovak Enterprises in the context of Internationalization in Business". The main objective of this project was to assess the level of corporate social responsibility in Slovakia in the context of the internationalization of business and identify the factors that affect their socially responsible behavior in a competitive environment. This article shows outputs of mentioned research particularly connected with the problem of business ethics. This consist of three main research questions. At the beginning we examined if surveyed companies have prepared an Ethical Code or the Code of Conduct and if they implement this in business practice. Second question assayed if ethical behavior helps companies to achieve business objectives and the third question deals with the problem whether the company favors business partners who prefer similar corporate values and business.

The total number of analyzed subjects was 58. These companies were established in different districts of the Slovak Republic and had a different organizational-legal forms, number of employees, year of establishment, and other characteristics. Research was conducted through a questionnaire survey. We addressed only trade companies and cooperatives, while individual entrepreneurs were not included. The largest number of researched companies was created by Limited Liability Companies (67%). 26% were Joint Stock Companies, 3% consisted of Cooperatives and 3% of Public Companies. More than 72% of them was established after 1994. Only four companies have a foundation year before the 1984th.

The largest number of surveyed enterprises (36%) has less than 20 employees. More than 22% of them has more than 20 but less than 50 employees, 14% has more than 50 but less than 250 employees and 28% of surveyed companies were "large companies" with more than 250 employees. Geographically, the majority of surveyed companies have been involved in exploration property in the western part of the Slovak Republic or in the basis of the river Váh. The biggest portion of these companies was located in Nitra region (37%).

Survey involved companies from fifteen industries according to NACE: Administrative and support services (1; 1.724%), Real estate activities (2; 3.448%), Electricity, gas, steam and air conditioning supply (1; 1.724 %), Water supply, sewerage and waste-water treatment, waste management and remediation activities (1; 1.724%), Transport and Storage (2; 3.448%), Financial and insurance activities (4; 6.897%), Professional, scientific and technical activities (2; 3.448 %), Other activities (13; 22.414%), Agriculture, forestry and fishing (6; 10.345%), Industrial production (17; 29.310%), Accommodation and food services (2; 3.448%), Arts, entertainment and recreation (1; 1.724%), Wholesale and retail trade; repair of motor vehicles

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and motorcycles (3; 5.172%), Public administration and defense; compulsory social security (1, 1.724%), Health care and social assistance (2; 3.448%).

The most of surveyed respondents have domestic owner (over 61% of them) and respondents had a majority owner of the state, respectively town, or village at least (accounted for just over 7%).

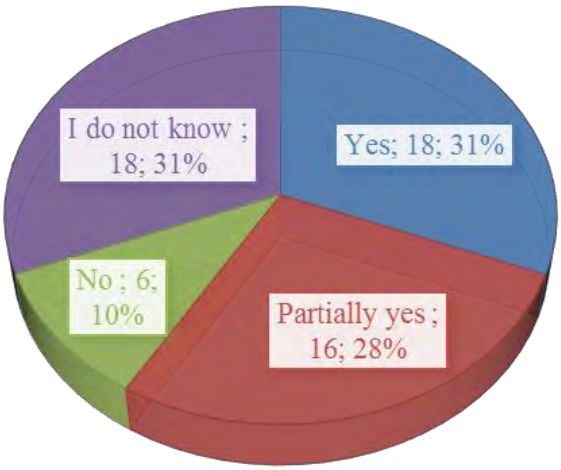
3. Results and Discussion

Our research was focused on the aspects of ethics in the business practice of selected Slovak companies. We were examining this problem through four multiple choice research questions. The first one was connected with the existence of the Code of Conduct as a formal document in company. In the second part, we connected the success in the business activities with ethical behavior on the market. Third question examined corporate ethics with the problem of Corporate Social responsibility and the last question focused on the preference of business partners who are implementing similar ethical concepts.

3.1 The Code of Conduct in the company

At the beginning of our research, we asked selected companies whether they have the Code of Conduct or other formal document aimed at business ethics. Eighteen companies out of the selected 58 answered that they have ethical code formalized in official document. This represents 31% of the companies. Despite the fact that this share seems to be optimistic, the same number of respondents (representatives of companies) answered that they do not know. This means that the issue of corporate ethics is relatively unknown in Slovakia. On the other hand, 28% of respondents said that ethical code in the company is formalized just partially and just ten percent of selected companies has no code of conduct in the company (fig.1).

Figure 1: Answers to research question: "Are there ethical principles formalized in particular document in your company?"



Source: Own research.

This answers clearly shows that 69% of selected companies knows the problem of corporate ethics and 59% of them have at least partly formalized ethical principles in business document.

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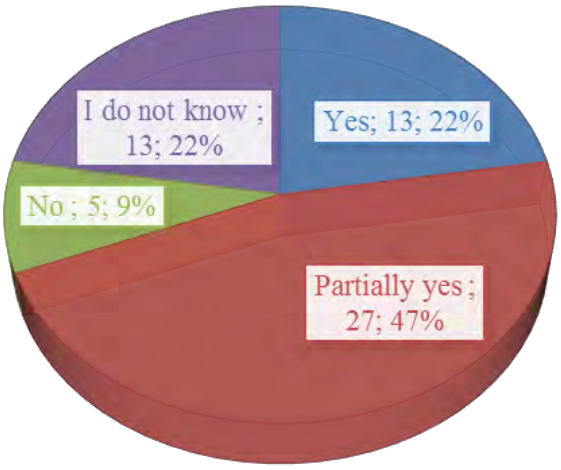
3.2 Connection of the Ethical Behavior and Success in the Business

The second question examined the connection of implementation of ethical principles and business success. Just nine percent of respondents think that implementation of ethical principles in the business have not positive effect on their business success. This time 22% of selected respondents have no opinion or do not know the problem. It represents 4% more that in the first question. On the other side, the same number, 22% of respondents think that ethics in their business help them in achieving business success and at least 47% partially thinks the same (Fig.2).

Figure 2: Answers to research question: "Do you agree that implementation of ethical principles in your business activities helps you in achieving business success?"



Source: Own research.

This means that 69 % of selected companies think that ethical practices in their business at least partly helps them with achieving business success.

3.3 Business Ethics and Corporate Social Responsibility

In this part of the research, we examined the question: "Do you implement the principles of corporate social responsibility in your business?" Most respondents choose positive responses. 31% of them implement principles of CSR in their business and 34% of them implement them partially, too. On the other hand, 7% of respondents are doing their business in socially irresponsible way. Similar as in the case of previous questions, 28% of respondents "do not know" and did not respond to this question (Fig. 3).

These results can be caused by many factors. Many companies have developed their CSR strategy for the weak level. Some of them implement CSR activities intuitive, without formal structure and official corporate background. Concerning small and indebted state-owned enterprises is the lack of financial resources to develop similar strategies and applications of the measures.

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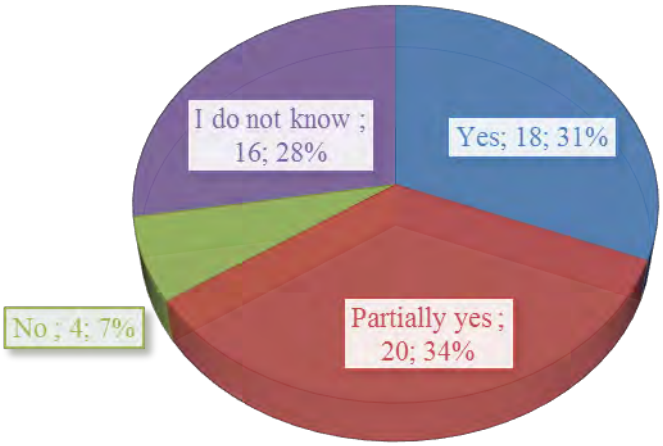
Figure 3: Answers to research question: "Do you implement principles of corporate social responsibility in your business?"



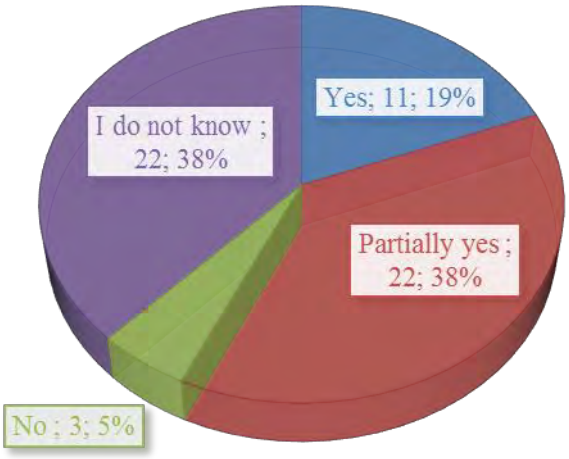
Source: Own research.

Answer "Do not know" may indicate a well-known fact that for companies in Slovakia concept of CSR is relatively new and strange. According to some authors, the CAP is still considered a relatively new concept, especially through its "phenomenal growth" in the nineties and the new millennium. (Crane et al, 2008). In Europe generally it has a shorter history than CAP in the US (Frederick 2008). In Slovakia, the boundaries for multinational companies and foreign investors "opened" after 1989 and principles of the CAP began to gradually penetrate into our country. The questionnaire survey shows that 18 of them fall under a foreign owner and therefore we can assume that it is precisely these companies have developed CSR concept to a new level.

3.4 Business ethics and business partners

Implementing of the principles of CSR and business ethics can start other changes in company. These principles should be included into corporate strategy and formalized truth official documents as The Code of Conduct.

Figure 4: Answers to research question: "Do you prefer business partners which implement principles of corporate ethics and corporate social responsibility?"



Source: Own research.

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These changes are connected with internal as well as external company environment and can be seen on the relationships with state authorities or business partners. In connection with this we include last question into our research. This examining if companies prefer business partners which implement principles of corporate ethics and CSR.

As Figure 4 shows, 19% of respondents prefers business partners who professes similar moral and ethical principles and even 38% of them does it at least partially. This time just 5% of them answered "no" what means that same moral values are not important for them in the process of choosing business partner. Interesting is that in case of this question 38% of respondents did not know to answer.

4. Conclusion

In the 21st century, CSR along with other social issues (such as corporate philanthropy and social enterprise) has become one of the key business trends all over the world. Companies have begun to realize certain commitment to society and its values, and have understood the importance of contribution into social, environmental and economic issues. Globally, CSR is considered as narrower part of international business ethics and with regard to accession of multinational companies into agro-food branch, its importance is increasing. Many of those companies perceive CSR as the factor increasing their competitiveness in the business environment.

This article includes the part of the extensive research conducted within research grant project VEGA no. 1/0044/13 "Corporate Social Responsibility (CSR) of the Slovak Enterprises in the context of Internationalization in Business "which is connected with the problem of Business ethics. This part of research consist of three main research questions. At the beginning we examined if surveyed companies have prepared an Ethical Code or the Code of Conduct and if they implement this in business practice. Second question assayed if ethical behavior helps enterprises to achieve business objectives and the third question deals with the problem if company favors business partners who prefer similar corporate values and business.
In this article we deals with the surveyed sample of the 58 Trade companies (and Cooperatives) from different districts of Slovak republic. Most of them was established after 1994 and more than a half of them belonged to the category of "small and medium sized enterprises" – SMEs. Survey involved companies from fifteen industries according to NACE classification.

Table 1: Summary of answers on research questions

No	Answer	Absolute frequency					Relative frequency in %				
		1	2	3	4	ø	1	2	3	4	ø
1	Yes	18	13	18	11	15	31,035	22,414	31,034	18,966	25,862
2	Partially yes	16	27	20	22	21,25	27,586	46,552	34,483	37,931	36,638
3	No	6	5	4	3	4,5	10,345	8,621	6,897	5,172	7,758
4	I do not know	18	13	16	22	17,25	31,035	22,414	27,586	37,931	29,741

Source: Authors´ processing.

According to realized research we can conclude that the number of monitored enterprises who strongly agree with implementation of ethical principles in their business is almost the same as number of monitored enterprises which are not interested in this problem at all. This outputs clearly shows that there is a lack in the implementation of the ethical principles and concept of corporate social responsibility in (selected) Slovak companies.

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Localization factors in decision making of location of selected enterprises

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Abstract
Localization is important for every enterprise to ensure its future successful development. Enterprise must take into account many localization factors to make the right decision. The main goal of the paper was to identify, describe, evaluate and analyze selected localization factors for the location of manufacturing enterprises. It deals with factors according to their importance for the selected manufacturing companies: K&J&G, Fimabo, TRW Automotive, Strechy 92 and Inalfa Roof Systems, important localization decisions and evaluation of selected localization factors for the business location. It describes six main categories, labour, market, land, infrastructure, environment and legal social and economic conditions, where are described and evaluated most and least important localization factors. This has been performed on the basis of the results which we have obtained through the filling of the questionnaire.

Key words: *business, enterprise, localization factors, location of business, manufacturing companies*

JEL Classification: *D22, D92, J22, L10, L20*

1. Introduction

Entrepreneurship is generally independent decision-making about what to produce and what services provide, about the legal form of the company, the location of the business, about the level of use of equity and loan capital and about the distribution of a profit. In addition, to meet the needs of customers and its own business development the entrepreneurship provides more society-wide goals such as creates jobs, innovation and technology progress, stimulates initiative and education, contributes to the formation of resources for education, social security, culture and so on. At the beginning every enterprise must make some localization decisions and must take into account several localization factors which help the company in deciding on the allocation of the firm. An important step for each newly-established company is the right selection of localization factors for the best business location.

After considering of all localization determinants and market research the company may finally decide whether a business allocates in given area or not. It is very important to make the right choices from the very beginning of doing a business, therefore, proper placement of any company on the market ensure its long-term and satisfied development in the future. Localization factors represent a set of actors that affect the location of a specific unit of production into a specific space. But it also depends on the businesses which sectors of the economy they choose. „Business is legally and economically independent, organized economic unit producing goods and services for the market. The activities which taking place in the enterprise are characterized as a business.“ *(Vlachynský, 2009)* According to *Singla, (2007)* “business may be defined as human activities directed towards providing or acquiring wealth through buying and selling goods.“ Other definition sound: “Business drives the economic pulse of a nation. It provides the means through which its citizens' standard of living improves. At the heart of every business endeavour is an exchange between a buyer and a seller.“ *(Boone, Kurtz, 2011)* The word business is very closely related to the combination of words known as business activities. *Pandey, (2009)* explains it as: “Business activities refer to the activities

which are connected with the production or purchase and sale of goods or services with the object of earning profit.“

Localization in the corporate setting is the extent to which expatriate managers are replaced by local employees originally held by expatriate managers. Also company support and top management's commitment as two sets of factors that predicted localization success. (*Law, KS., Song, LJ., Wong, CS., & Chen, DH. 2009).* As *Cantwell (2009)* states that „in the early development of the international business field, the focus of attention moved from the country level to the firm level, and interest in location issues declined. More recently, firm-based research has itself become increasingly concerned with the study of firm-location interactions.“

Localization factors are a set of actors that operating in the placement of a particular production unit in a concrete area. By this term we understand the geographical location at which should be placed all the production factors of business for the purpose of providing goods or services. The localization affects both internal as well as external factors. „It always depends on the particular decision-making situation which of those production factors manufacturing company will prefer. All decisions are doing before establish the business.“ *(Džupka, (2009)*

The basic objective of location of the businesses is determining the placement of the entities in the concrete area. Then the company has to decide what will be its field of entrepreneurship and after that may be classified to a specific business sector production. *Parmer, (2002)* claims: “location of economic activity means the activities related to production, exchange and consumption of goods, services and information on the rotating earth and in universe. The location where these activities take place is called the location of economic activity.“ *Cambers, Currie, (2002)* states that“The factors that influence the location of economic activities vary. The enterprises or business companies often weigh up the advantages and disadvantages of a number of locations before deciding where to build.” „Localization factors are important for the enterprise if it has an influence on costs, respectively on revenues of the enterprise and that availability, quality or price of the factor must be spatially differentiated. Only when both conditions are met, arise different conditions in various localities for the enterprise, and it must take them into account in decision making.” *Belajová, Fáziková, (2002)*

Location decision is one of the key decisions of the enterprise in strategic planning. It is one of the first challenges faced by the enterprise during its life-cycle. Localization decisions have major impact on the functioning of the company. *Buček, (2010)* states that: “Although it might seem that firms due to cost savings are searching for the optimal location in the area of inputs, large part of the business sector focuses its operations on the areas of the realization of outputs - markets.“

2. Data and methodology

For every new enterprise which starts operate on the market is very essential the proper placement of localization factors that contribute to the correct flow of whole business. By the word localization we understand the geographic location in which should be placed all business factors of production for the purpose of providing goods and services. Proper location of the company speaks about the future status of certain business, its inputs, transformation process and outputs that needs to be achieved in the future. The main aim of the paper was to analyze and evaluate the localization factors and their location in selected manufacturing companies. The objects of examining of the paper were specific manufacturing companies: K&J&G, Fimabo, Strechy 92, TRW Automotive and Inalfa Roof Systems.

In achieving the results we have used the following methods as method of analysis, method of comparison, method of synthesis and method of controlled dialogue. But the main used method

was the method of questionnaire survey. This method is one of the most common tools for data collection for different types of surveys which consists of a series of questions designed to obtain facts and opinions from respondents. The questionnaire and localization factors in it are based on the available literature on this topic and adapted to the nature of selected enterprises. The questionnaire of localization decisions consisted of the general characteristics of a business, where concrete company provided its name, place of action, legal form of business, number of employees, number of years in business and its location. Questions in the questionnaire were constructed in the form of opened questions. In specific characteristics of the company are divided 24 localization factors into 6 categories, namely, labour, market, land, infrastructure, environment and legal social and economic conditions. To assess the importance of localization factors there is provided point scale from grade 0 to grade 4. Where 0 represents the degree of no importance, grade 1 low importance, grade 2 average importance, grade 3 major importance and rate 4 refers to ultimate importance.

3. Results and discussion

In today's world of business where there is too big number of enterprises and competition is very strong it is important for the enterprise to be innovative and creative and to think predictably to be successful in longest period of time. Nowadays it is not very easy to be successful on the market and that is why the localization decision is fundamental part of starting the business. For each enterprise which wants to start a business or which wants to expand its scope it is very important to take into account localization factors. Right, actual and reliable information are the key for proper localization of the enterprise.

3.1 The importance of location decisions

The basis of the market economy is the freedom of entrepreneurship. Enterprise as an institution in this area is subject of examination of several economic disciplines. Under the subject of every manufacturing company we understand a business activity where the inputs are transformed into outputs production in the form of goods, services and information. These outputs by its quality and quantity also affect the socio – economic processes which take place in the concrete area. An important milestone during the establishment of the businesses is creating of the spatial structure which has the greatest influence on them. On the formation of the spatial structure have the strongest impact businesses and their localization decisions. In connection with the structuring of the space, companies decide where and at which point in a particular area will develop its manufacturing, trading, development or administrative activities. Each enterprise can focus all their activities in one location (one enterprise operation) or may be distributed in multiple locations (company with more operations or so-called subsidiaries). In achieving the corporate goals, all business operations together must coordinate its activities through supplier, information and control relationship between them. Location decisions also affect the running of the businesses. They decide on the sales network, who are their purchasers and how the deliveries will be carried out, or about warehouse management system such as materials storage or just-in-time- system. Effective tool for the spatial structuring is the wage policy of the enterprises. Rates of corporate wages affect the amount of regional income and thus define the labour market for a given company. For any business, of course, is very important where will be located.

The importance of location factors is given by the type of product, type of technology, degree of localization and mobility. All factors that are important for a particular enterprise must meet specific requirements for quality, quantity and price. Types of technology or innovations which are used to produce a certain product are those which are not exhausted yet and matured technology such as biotechnology, development of new materials, engineering, electronics,

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production of working tools and others. Degree of localization means the density of location factors in space. From this company knows whether the locality is the right one. Mobility of localization factor means the possibility of its transfer, respectively opportunity of product transfer, as well as the costs associated with its transfer. Another factor in the localization of businesses is land. The most important is the quality and price of land. Environmental factors nowadays do not have a fundamental importance in locating of manufacturing companies. Category labour force acts as an important factor that can affect the localization of production entities. Ability to attract and retain workers is one of the major factors which are necessary to bear in mind when selecting suitable localities for businesses location. While the importance played two kinds of labour. On the on hand, in every company there are required highly skilled workers, scientists, engineers, managers and on the other hand, cheap labour for the sphere of services and for simple production. When planning a location it is necessary to plan not only the areas that are immediately available for sale, as well as the total area of retail which includes secondary areas such as parking areas, storage areas, administrative areas and others. Location decisions are complex and long-term.

The main part of the paper is focused on localization of businesses and importance of location factors for individual companies at the cradle of their business. On the localization of the enterprise impact both, external as well as, internal factors. For internal factors, we consider lack of financial resources, personnel problems, lack of information and others. And for external factors, we consider, in particular, an area of legislation, rules and regulations but also political or environmental measures. Every company in the beginning of its business activity must examine and evaluate which of the localization factors are the most appropriate for it and vice versa. In important determinants are the costs of inputs and outputs, market opportunities and emergence of new competitors. The companies in their allocation must obviously take into account the type of customers for whom they want to provide their goods and services, purchasing power and price level of services in the given region. In addition, for better running of the business entity they have to determine new production methods, transport and communication techniques, technologies and innovations that will have the best effect for the successful starting of a business.

3.2 Survey results of location factors

Trough the questionnaire we found out the significance of the placement of localization factors for given manufacturing enterprises. We identified which of them had ultimate importance for companies when starting a business, and on the contrary, which have the least importance. The degree of importance is indicated by the scale 0 – 4. This survey was drawn up by directors, managing directors or shareholders of the concrete company through the face to face conversation.

From the results of the questionnaire we found that the ultimate important factors of location in category labour were qualified as well as non-qualified labour supply. It is because when all manufacturing enterprises started doing their business they did not need only educated people in the field of management, accounting and other business areas but they needed also unskilled people who know working manually or with the help of machines. In 1993, the K&J&G had only two permanent employees and changing number of temporary workers employed according to the volume of production. Over the years, the number of employees increased and nowadays the company employs around 300 personnel. The company Fimabo began with its business activities and production only with number of three employees. Other companies such as Strechy 92, TRW Automotive and Inalfa Roof Systems started their business at abroad and lately spread their subsidiaries on Slovak market. Labour costs were also major important factor. During the construction of business it was significant to find the workers who are willing to work for minimum wage. The mentioned foreign companies were located in Slovakia mainly

due to cheap labour force. Therefore, the firms employed unskilled labour force that needs to have mainly good physical and manual skills instead of intellectual knowledge. Another main attribute required by businesses was flexibility of workforce. Managers and directors of the firms also mentioned the fact that the Slovak labour market is not only inexpensive but also has a good performance level. So they required the personnel who were be able to adapt to any work, what means, that every single worker was able to deal with multiple devices or other production machinery. On the other hand, the least importance for all companies in this category has supply of workforce with disabilities. The reason is clear. Whereas all firms are dealing with production activities where workers handling with heavy apparatus, materials and metals, then people with disabilities could not perform such hard work.

In the category market the most important factors for all enterprises was the organization of distribution network. This stems mainly due to the fact that all studied companies had to know and evaluate alternative distribution channels at their beginning. Each firm had set the type and number of intermediaries. However, the main cause is that the companies cooperate not only within Slovak market but also at abroad. Within a few years of enterprises existence they enlarged its distribution channels to several developed countries in the world. The Inalfa Roof Systems distributes its products to Brazil, Sweden, Deutschland, South Korea, Mexico and others. The K&J&G has the distribution network spread to Croatia and Serbia. Distribution network of the TRW Automotive is divided to Chine, Brazil and Poland. Only the firm Strechy 92 has the distribution network spread between Czech Republic and Slovakia and vice versa. Finally, the Fimabo distributes its final goods to Slovenia, Austria and Czech Republic. The major or average importance for the companies had factor called proximity of suppliers. Every firm needed before the primary production some raw material, metals, wood, other materials or parts and components which are distributed through direct suppliers. But the main aim of studied firms was to have their suppliers closest to its organizations. Intensity of competition in the sector had a major importance for every entrepreneur. As well as our companies when starting a business, they were looking for the most appropriate location of business activity. They preferred mainly peripheries and places in the regions where the development of similar business activities have not been advanced yet. The average importance for the companies had size of local market. The fact was they had set a priority beforehand that their produced goods and services will be expanding to our whole country and later to abroad. So the size of market where they started to perform their activities had not a great impact on localization.

The next category which was examined in this paper is called land. The most important for all enterprises were size and rental prices of land. The companies started their function in small leased buildings, garages and other premises. But it did not take a long time and all companies, after a few successful years of their formation, managed to purchase the leased premises to the own property and even expanded their plants. From this we could say that the property rights to land become irrelevant these days. Although this process of converting did not change from year to year but it depended particularly on the turnover and total profit of the all businesses.

The key category for all manufacturing companies is infrastructure. The major importance for studied firms had complexity and costs of roads. When the companies started to distribute its first products mostly they had not purchased their own means of transport. So the expenditures connected with infrastructure were high because they had to pay for the external services as well as for the toll roads and other fees connected with it. That is why all enterprises carefully selected from the range of external firms which ensured transport of goods over the country. In later period, all examined companies have purchased its own transport facilities except the Inalfa Roof Systems which still uses the service of an external importer and exporter. Availability of storage space had an average importance for the manufacturers because they were trying to sell as many products as possible on the market and only a small amount retained

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at warehouses. The reason is that selected companies use the just-in-time method, what means, that the purchased material is immediately used in production process and the finished product is promptly placed in the market or to the final customer. Another major importance had factor named possibilities of advertising or exhibition. Not only for selected companies but for any other types of business in the economy sector is essential to have a well established advertising. Even though, the advertising and activities associated with it have been important factor for the researched firms, their expansion was greater after 5 years of doing business. Level of the institutions and services supporting regional development had no or low importance. This is the case that the companies at the beginning of their business activities were devoted mainly to issues related to the price and level of the financial services, whether the services in regions are expensive or cheap. Also leading role played the level of legal and economic services in concrete region. That is why the companies did not take any weight for supporting regional development. Because the priority of every start-up enterprises is to have financial security for the smooth running of the business and later they may think about supporting of their region.

Environment category which includes possibilities of storage, disposal, recycling and local standards for discharged dangerous substances were ultimate important factors for each company. These factors were very significant because the companies' role was to store all of the manufacturing materials and produced goods in dry and well placed storage conditions. In the firm K&J&G recycling of used materials for the company provided in past and still does outside firm which also imported the oils and materials for further production process. Likewise, other studied companies respect the local standards when discharge some risky substances. All enterprises carry out these issues because they try to keep not only inside environment but also its outside area, population in good environmental conditions. The least importance in this category had a climate conditions. It was because of the fact that the companies manufacture their goods and services in buildings, halls, garages or other roofed buildings so they do not depend on any weather changes.

The last category which has been studied is named as legal social and economic conditions. The biggest importance had proximity of industrial parks and business indicators. This factor was essential for each company mainly because the enterprises were dependent on other businesses which buy products, materials and final goods which were previously produced by studied companies. Other factors which played a major importance were economic and political stability of the region and production and consumption habits of population. This is due the fact that the companies depend on economic, social and political changes in given region. Based on the growth of the regions also studied plants were able to further development. Another argument is also that firms had to monitor the employment level in regions where they wanted to settle down. They were looking for the unemployment rate which causes that people in concrete area would not be able to buy their final goods and use offered services. Although this criteria had only average importance for the firms, because as we mentioned in connection with the distribution network, all researched companies could not depend only on the consumption of Slovak citizens but also on foreign consumers.

For better imagination of surveyed firms and their most important and least important factors which had to be considered in locating of the companies we may see in the Figure 1.

Figure 1: Evaluation of localization factors of surveyed businesses

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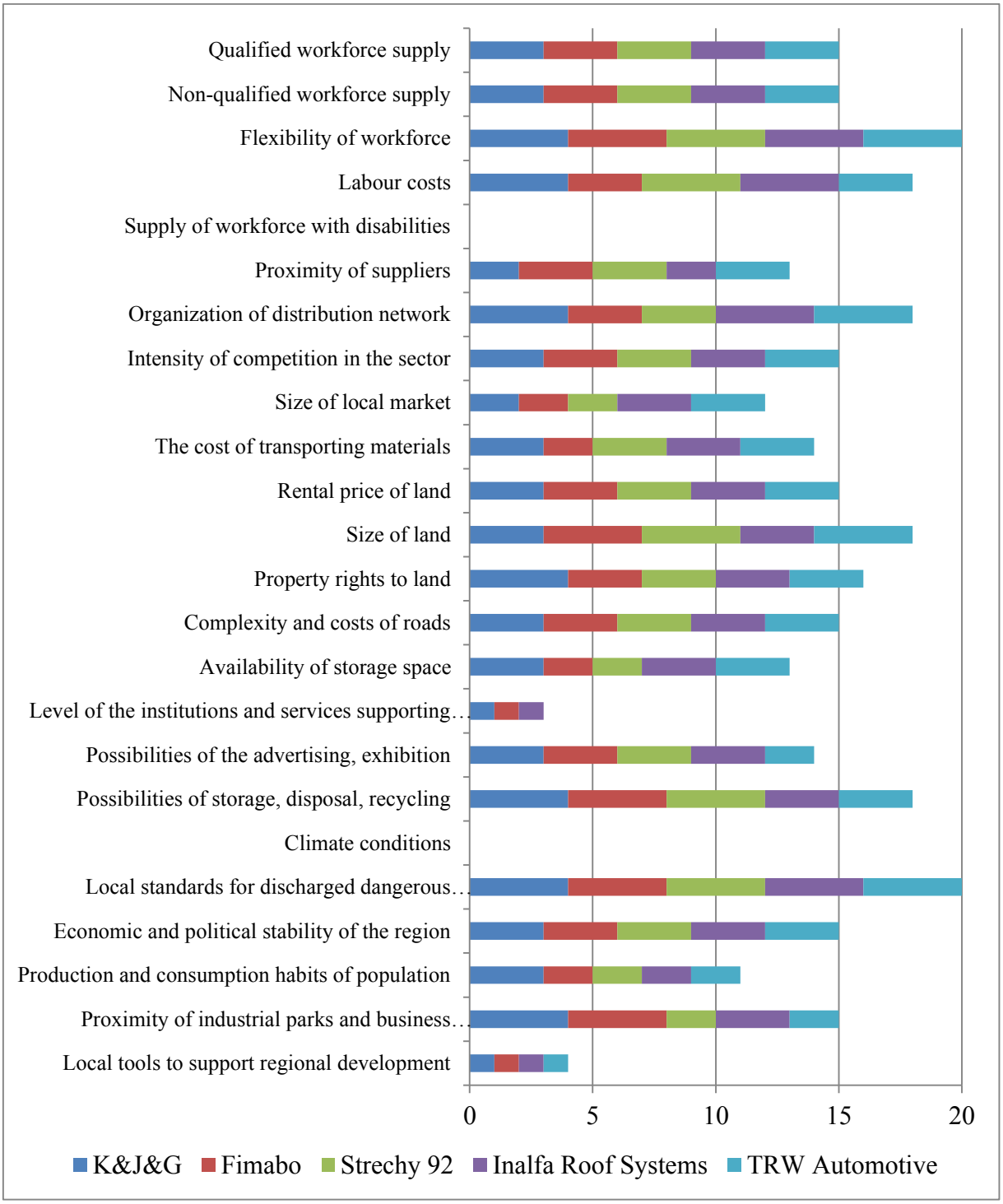

Source: own processing

After researching all the factors of localization based on the questionnaire in given companies we may say that the most important determinants for manufacturing companies when opening their business were chiefly flexibility of workforce as well as the costs connected with labour force, organization of distribution network, size of land, complexity and costs or roads and possibilities of storage, disposal and recycling. Other additional major or average important factors were qualified as well as non-qualified labour force, proximity of suppliers, intensity of competition in sector, size of local market, rental price of land, availability of storage space, possibilities of advertising or exhibition, economic and political stability of region and production and consumption habits of population. The least significant determinants were

supply workforce with disabilities, level of the institutions and services supporting regional development, climate conditions and local tools to support regional development.

4. Conclusion

Currently, in the developed market economy can be successful such enterprise which is able to meet increasingly demanding customers needs through offering new and high quality goods or services. It is not enough just to produce a quality product and offer good services but it is also necessary to take care about the fact that these produced goods and services are available in the right quantity, at the right place, in the right time and this through expending of reasonable costs. An enterprise should by its offer flexibly react to competition, cope with it, or possibly overcome it. Every company must act economically, in order the prices of goods and services were comparable to those offered by the competition. Success of enterprises on the market depends on several factors such as increasing quality, reducing costs and increasing flexibility. However, the most fundamental determinants in setting up of the company include the localization factors which are closely related to analysis of market, labour, infrastructure, environment, economic and social stability of the region in which the company wants to start doing a business.

The aim of the paper was to evaluate the importance of localization factors of selected manufacturing companies. We have also examined and compared the location decision of the selected enterprises to analyze, describe ant compare the most important localization factors. When examining the localization factors we have found that the major determinants for the allocation of these firms were flexibility of workforce and related costs, organization of distribution network, size of land, local standards for discharged dangerous substances and economic and social stability of the given region. On the other hand, the least important factors were supply of disabled workforce, climate conditions and level of the institutions and services supporting regional development.

Among the main plans for strengthening the business sector in the Slovak economy should be primarily the forms of support such as an aid from EU structural funds when doing business, some support programs for small and medium size enterprises, state aid and other investment aid. In order to our business environment will become more stable is also required cooperation with a several economic sector, because in spite of their different nature all sectors are involved in developing of a stable business environment. If Slovakia manages to improve the economic, political and entrepreneurial stability it may bring benefits not only for the Slovak entrepreneurs but is also increase the chance to attract many other new or foreign investors.

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SESSION 5

Finance and current issues

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Principal-agent model in agricultural based projects in the Republic of Armenia (the problem statement)

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Abstract
The rural development projects in emerging countries are tight lines for developing the agriculture. They are considered important, as they provide the inputs for industrial development and increase export earnings, they contribute to food security as well as provide agricultural products for local markets. In the Republic of Armenia there are number of agricultural based projects that were implemented and are being implemented. Usually these projects are financed by international donors and are realised by locally selected institutions.
We have adopted principal-agent model in the process of project implementation to show the possible information asymmetries that could be raised between international donors and implementers. The parties involved in the project implementation are the principal (i.e. Project donor), and agent (i.e. Project implementer). When donors are delegating the agents to complete the project there is a risk of information asymmetry. If the implementer behaves opportunistically, it could use it into its utility maximization. The outcome could be the decrease of project contribution allocated for beneficiaries. In this paper, we show the probable risks of parties' relations. We propose too, some risk minimization strategies that we think will alter the information asymmetry. First, prior to project delegation there is strictly recommended to study the implementer experience and the path that he/she has completed. Second, during implementation process increase the monitoring of specific tasks that were proposed by project plan.
The following suggestions are made for projects that are existent in Armenia; however, we think that they are applicable in use of other countries examples as well.

Keywords: *Armenia, Principal-Agent Theory, Agricultural Project*

JEL Classification: *H43, O22*

1. Introduction

The agricultural sector plays a crucial role in economy of Republic of Armenia. Except government strategies to develop the rural sector, some contribution for rural development is done by rural development projects. Rural development projects are considered as important drivers of development, as they provide the inputs for industrial development and increase export earnings, and contributed to food security. In the mentioned agricultural projects the direct beneficiaries are the community members i.e. farmers. In some projects, the society is considered as an indirect beneficiary, which is not directly involved in the project. The next player in this chain is the project implementer. This party implement the projects as beforehand planned. The direct and indirect beneficiaries are the final particle of this chain.

In the Armenia the agricultural based projects cycle starts from the contributor who finances the implementation of designed project. The contributor is international donor who in other hand receives money from governments as the membership's fees or from various donor agencies. The principals (project donors) are delegating the agents (project implementers) for projects implementation. Delegation of tasks establishes a principal-agent relationship between the project owner and contractor (Müller & Turner, 2005). During the project implementation, the information asymmetry could be raised as in classical example of principal-agent problem,

and in this case, the good communication between project participants will be crucial for project success. Information asymmetry is the situation in which one of the two parties is better informed than the other (e.g., Jäger, 2008). In this case, the good communication between project participants is crucial for project success.

As the principal-agent theory shows that, the asymmetry of information exchanged between the agents and their principals may lead to significant problems. In this research, we demonstrate the possible risks that could potentially decrease the effectiveness of the project in relation with principal and agent. We show too, some risk minimization strategies during the project implementation processes. Within the frames of this study, the diagram was created in which possible information asymmetries have been demonstrated. This is very important for increased effectiveness of the projects for beneficiaries.

2. The Principal-Agent Model and its Application

The relationship of agency is one of the oldest modes of social interaction. An agency relationship has arisen between two or more parties when one, designated as the agent, acts for, on behalf of, or as representative for the other, designated the principal (Ross, 1973). It occurs in direct measure to a decreased risk of the probability of cheating on the parts of both the principal and agent. In its context the principal-agent problem could be characterized as delegated decision-simulation, where one economic subject, referred as principal, strikes a bargain with the second subject (agent) while there is expectation that the agent would decide for the benefit of the principal (Hlavacek, 2006). In the case of the principal-agent framework, this is structured as a method for analysing problems where one party i.e. the principal, hires another party i.e. the agent, to perform certain task for him or her (Miller, 2005). There is a possibility when principal delegates an agent a task could be raised a situation in which one of the two parties is better informed. In these kinds of situations because of communication barriers, asymmetric information could be developed. As it is assumed that all individuals are expected utility maximizers and are risk-averters (Pauly, 1968) in this case the agent could behave opportunistically, and use the information asymmetry in favour to own utility maximization (e.g. salary, power status, reputation etc.).

Following types of information asymmetries apply for acting parties: hidden characteristics, hidden information, and hidden intention. Respectively, these three types of information asymmetries create following risks: adverse selection, moral hazard, and hold-up.

Adverse selection problem is the phenomenon where people in the informed side select an option that is harmful to the side of people that are uniformed (Katz & Rosen, 2009). In both sides could happen that some are informed and some are not informed. This is then translated into a coordination problem among uninformed parties. This coordination problem plays an explicit or implicit role in a wide variety of the models (Akerlof, 1970).

Moral hazard economic concept was introduced in 1963. In the moral hazard, is the principal loses ability to control the actions done by agent, and those actions cannot be contracted upon, because no one can verify the value of the agent's actions (Laffont & Martimort, 2001).

Williamson (1985) defined the hold-up problem when either of the two sides of the parties make an up-front investment in the transaction which causes the other side to behave opportunistically and make ex-post bargaining. He noted also, that the hold-up situation allows the side, which invested less in the transaction, to force its conditions opportunistically on the side, which made the upfront investment. Consequently, in a situation when projects require the participation of more than one party, the hold-up problem arises when the party who undertakes the investment (the investor) cannot recover the fixed cost of the investment ex-

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post, because once the investment has been made, it is sunk and has no other use. As a result, the other party (the contractor) will have every incentive to squeeze the investor ex-post so that it makes only enough to cover its operating costs.

According to Schieg (2008), there are six strategies for minimizing information asymmetries between project participants:

1. Bureaucratic control
2. Information systems
3. Incentives
4. Corporate culture
5. Reputation
6. Trust.

The bureaucratic control is about the contracts. There is endorsement to keep all the actions and any kind of action by singing mutual contracts between principal and agent. These will influence the agents' behavior, by keeping them more accurate in any decision that they will act. The second point, the economic models of information are often about the information environment – who knows what when. Specifying these features carefully in the model is critical for understanding what will follow. Information is not a standard market good i.e. it has no marginal cost to each person knowing it, it is not consumed, not a typical experience good where you can try before you buy, it is extremely difficult to measure, observe, verify (Autor, 2010). Therefore, there is a need to construct a strategic information system, which will ensure the flow of information openly and appropriate to all users. Regarding to incentives Schieg (2008) refers to bonuses which could be motivating too, and to keep agent to work for principal accurately. However, if the agent thinks that the bonus is less than the expected action, which will bring him or her an output, maybe he or she could choose to behave opportunistically.

It has been suggested, that trust can substitute for monitoring in agency situations, and vice a versa that a failure of trust significantly reduces the gains of economic cooperation (Putnam, 1992). However, the trust factor is non - calculative behaviour. Trust occurs neither randomly, nor in advance. (Williamson, 1993). Therefore, the trust factor is very critical for both sides.

3. Data and Methods

In the study the data have been taken from the reports of the organizations implemented various projects with the purpose of agricultural development. The principal-agent model was adopted to the agricultural based projects implemented in Armenia. Upon the model, the diagram has been constructed, which helps to demonstrate the possible information asymmetries between project implementers and donors.

This study is showing the problem, which has negative influence to the projects outcome. This approach could be used for development of further studies.

4 The Principal-Agent Model Adoption in Agricultural Based Projects in Armenia

Contemporary projects are rapidly different as it was in the early stages of project management development. The style, period, complexity of the project with its minor and major number of inputs and outputs now are different. Nowadays, we have more interested parties who are ready to contribute to projects' implementations in Armenia. As the result, the number of projects

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have been increased in the society. Now donors/international agencies are more demanding the implementation process, as well as the successful completion of the objectives. In other side, project implementers are more attentive and vigilant during the implementation process. Complex projects and rapidly growing opportunities with contemporary information technology generate number of risks and challenges, which are going together with project implementation path. Thus, the attentive eye is vital throughout the implementation of the project. In addition, the contact between project donors/international agencies and project implementers are based on direct cooperation. However, sometimes this can proceed with information asymmetry, and if the project implementer will behave opportunistically, he or she could use the information asymmetry in favour to own utility maximization.

Projects, mainly agricultural based are important tool for development of agriculture in less developed countries. They help to increase agricultural outputs, to organize effective and efficient agriculture, in total support communities to grow. In addition, projects help community members to meet with new trends, which are in agriculture. Thus, taking into consideration the project importance in development of agriculture we should strive to find ways to maximize projects effectiveness for beneficiaries. In Armenia, there are implemented and continuing projects in rural sector as well as in other sectors.

In our study, we have the same situation where the donors are delegating the implementers to complete the project. As noted earlier, delegation of tasks establishes a principal-agent relationship between the project owner and manager, where the principal (project owner) depends on the agent (contractor or project manager) to undertake a task on the principal's behalf. It can be assumed that an agent will try to maximize his or her own benefit even when that may involve a higher damage to the client (Schieg, 2008). Good communication between key participants is most important for the success of every project (Ceric, 2003). Because of communication barriers, asymmetric information could be raised, and this is nothing more than the one party is better informed with specific information rather the other one.

In our case, the principal is considered the project provider or the same as project supporter and the agent is considered the project implementer. During the implementation, of the project there could be a potential conflict of interests between project participants because they all have their own interests, as well. Underneath is the constructed figure showing the parties involved in the project, their self-interests, information flow, and the delegation of the job.

Figure 1. Principal-Agent Problem in the System of Agricultural Based Projects in Armenia

Source: Own results

Note: PM-Project manager of implementer, R-Representative from the donor side

In the figure above, we express the four parties and their self-interests even though the project objectives are the same. The parties are the following: principal, agent, project manager,

representative, beneficiaries and the society. The self-interest relevancy is extended in the case of principal, agent, project manager and representative from the principal side.
We have considered the agricultural project in where the principals hire an agent and delegate the project. In this turn, agent hires a project manager and delegates the project implementation process to him or her. The representative from principal side regularly monitors and controls the workflow and gets the reports from the project manager side. The orange curved arrows are showing that each participant has his or her self-interest. For instance, the project manager could apply discretion in making and implementing policies to maximize its own utility rather than maximizing the utility of project donor, which in this case is the increase of project effectiveness, which eventually brings positive changes in the economic conditions of project beneficiaries. Therefore, the management utility maximization is applied.
Thus, indeed there should be developed strategies that will control the self-interest of acting parties. We think that donors should construct it, as there is no incentive for implementer for that. This problem is vital for project success.

5. Conclusion

In this study, the principal agent model is applied and we showed that in agricultural based projects when the donors are delegating the implementers to complete the project the information asymmetry could be raised and if the implementer behaves opportunistically it could use it into own favour for utility maximization.
There are some risk minimization strategies that will alter the information asymmetry which has the direct influence on project success that could be outlined: Prior to project delegation there is strictly recommended to study the implementer experience on the area of the project and the path that it completed – sometimes this basically creates environment when the implementer is not so professional in the specific issues and the work that it will do will not be so efficient as planned, during the implementation process increase the monitoring – this will increase the implementer's responsibility towards the completion of objectives.
During implementation process, increase the monitoring of beforehand allocated tasks that were proposed by project plan. This will increase the implementer's responsibility towards the completion of objectives more carefully. The following suggestions are made in the case of Armenian projects however; we think that they are applicable in use of other countries examples as well.

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What is wrong with the concept of specialized financial institutions in the Hungarian agriculture?

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Abstract
In the second half of the 20th century, besides the positive benefits of intensively industrializing agriculture, social and environmental problems seriously threatening sustainable development appeared. By today, in response to the warning signals very strong expectations have been formulated regarding the agrarian sector – broadening its traditional roles -. In summary, agriculture has complex productive, regional, ecological, social and cultural functions. The social utility of the above mentioned functions is indisputable, their fulfilment is the strategic interest of all countries, and it is also the key to their sustainable development. However, there are political, economic and social conditions and processes that impede the realization of these objectives, while at the same time urge conscious measures to this effect. The aim of our study is to investigate the possible financial resources of agricultural production taking into account to a maximum extent the 'environment- and human-friendly' aspirations and to find the factors which help or hinder the competitiveness and effective financing of the agrarian sector. We examine the possibilities of establishingt and operating a state initiated agrarian bank, which up to now appeared only on a rhetoric level aimed at ensuring cheap and efficient financing of domestic agriculture, based on domestic experiences and international models.

Keywords: *specialized financial institutions, agricultural bank, credit union*

JEL Classification: *Q14 Agricultural Finance*

1. Introduction

In the second half of the 20th century, besides the positive benefits of intensively industrializing agriculture, social and environmental problems seriously threatening sustainable development appeared. By today, in response to the warning signals very strong expectations have been formulated regarding the agrarian sector – broadening its traditional role (van der Ploeg, et al, 2002).. These include:

- production and processing of high-quality food and cheap raw materials
- provision of alternative sources of energy
- preservation and rational use of natural resources to protect the environment
- maintenance and development of the producers' infrastructure
- responsible management of landscape
- (partial) provision of rural livelihood by production, processing and additional industrial and service activities, resulting in the preservation and renewal of rural communities and society

In summary, agriculture has complex productive, regional, ecological, social and cultural functions. (Takácsné 2007)

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The social utility of the above mentioned functions is indisputable, their fulfilment is the strategic interest of all countries, and it is also the key to their sustainable development. However, there are certain political, economic and social conditions and processes that impede the realization of these objectives, while at the same time urge conscious measures to this effect. The aim of our study is to investigate the possible financial resources of 'environment- and human-friendly' agriculture and to find the factors which help or hinder the competitiveness and effective financing of the agrarian sector. We examine the possibilities of establishing and operating a state initiated agrarian bank, which up to now appeared only on a rhetoric level and aims the cheap and efficient financing of domestic agriculture, by drawing on domestic experiences and international models.

2. Data and methods

The aim of our article is to make an overview of the fundamentals of agricultural financing, regarding the main functions, specificities and risks of agricultural production, discuss the most important (political, economic, social) influencing factors, examine the (mostly European) models of agricultural financing and adapting them to the circumstances in Hungary. For these purposes we reviewed the international and Hungarian literature related to the topic, and used the data of the Hungarian Institute of Agricultural Economics to investigate the structure of agricultural financing in Hungary. In our concluding remarks we relied on the informations concerning the agricultural financing policy initiatives since the 1990 change of regime, and prepared a possible scenario for the actual introduction of specialized agricultural credit institution.

3. Results and discussion

3.1 Changing environment, new rules of play

First of all, it is important to recognize that the actors of agriculture around the world have to adapt to a rapidly changing global system of conditions (Csáki 2012). Due to the demographic explosion, the demand for food is rising (with regionally different needs), and the bio-energy production's need for raw material has to be expected as well. Because of the energy-dependence of food production, the volatility of agricultural prices increased following energy prices. The importance of integrated vertical product chains is increasing, accompanied by the accelerating concentration of food trade. Especially in the developed and moderately developed countries the agricultural population is aging, and the gap between urban and rural incomes is growing. The production – particularly in developing countries – is accompanied by increasing environmental problems and the emerging threat of climate change.

Though, in addition to the difficulties listed above, perhaps the biggest challenge is the unavoidable liberalization of international markets. The agricultural sector's food and energy producing, social, rural development functions are hardly compatible with the market competition, the liberalisation of external trade, the constraint of competitiveness and the principles of the World Trade Organisation (Nagy P. 2001) In order to enforce both criteria simultaneously and reach an acceptable compromise, the restructuring of interventions and policies which distort international markets is needed, together with the establishment of public and market institutions for the regulation and surveillance of market operations. (Valdes-Forster 2005)

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3.2 Renewal constraint in the agricultural policy

In the case of Common Agricultural Policy – which serves as the framework of the Hungarian agricultural policy as well– we are witnessing a continuous learning process and transformation. Beyond providing viable rural area and relatively stable income for the agricultural population – especially in the EU-15 countries – in addition to safe food, by now its operation raises questions in the long run. European agriculture is still struggling with overproduction, while the proportion of community budget allocated to agricultural policy generates debates on several fronts. On the one hand between the countries (e.g. the biggest net contributor Germany and France, for which the support system is the most beneficial), on the other hand between other economic sectors (including the tax-paying households) and – from their perspective – the highly over-budgeted agriculture. "The Union was not created for the farmers! It was established to be able to supply its half billion citizens with a wide variety of products and services." (Nagy F. 2012 in: Fehér et al. 2012 p. 56.)

Due to its protectionism and market-distorting interventions, CAP is the target of constant external criticism by the major agricultural producer nations, the developing countries and the WTO, despite the significant steps taken in tariff reduction, the decoupling of support and production, and the reduction of export subsidization. (Massot, 2013) The market protection favourable to atomized farms and the extensive subsidy system did not help the improvement of agriculture's productivity and efficiency, coupled with the frequent use of opportunities for abuse hidden in the system. (Tracy 1997)

The 2014-2020 CAP clearly tries to meet the different expectations, as – in order to increase competitiveness and marketization – it includes the progressive reduction and capping of supports, the introduction of more efficient instruments of risk management, the encouraging of producer and interbranch cooperation, clustering and networking, the development of knowledge transfer and advisory activity, the promotion of innovative initiatives and the simplification of bureaucracy. At the same time, the CAP makes the transition easier by supporting the production in less favoured areas, giving subvention to young farmers and start-up micro-enterprises, proclaiming the fight against poverty and social exclusion, and the financing of local initiatives from multiple EU funds.

3.3 The fundamental problems of agricultural financing

Agricultural production has specificities that affect producers adversely in terms of financing. The production is linked to to immobile factors (land, labour), and is based on biological organisms characterized by cyclical growth and development requiring contninuous expenditures, but having only temporary results. The profitability of the sector is low, volatile (Buday-Sántha 2001), its capital demand is high, the return on equity is slow and risky, the possibility of restructuring is limited (Burgerné 2002). Further organizational and financial problems are raised by weather, animal and plant health risks, market anomalies, as well as the seasonal nature of the utility of assets and labour. (Csete-Láng 2005)

The deterioration of the sector's income position started after the 1990 regime change, due to the decline of the significance of agriculture in national economy, the loss of foreign markets, the decrease in domestic consumption, the deterioration of efficiency arising from fragmentation, the broadening of agricultural price gap and the overall financing difficulties. In addition, the income "flows through" the sector because of the land rentals and the prices of services (Udovecz 2000).

The accession to the European Union brought high hopes for all actors in the economy, so obviously for the agricultural sector too. Antal (2005) writes in her analysis:

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"For the agriculture facing deep crisis since the regime change, the only possible alternative was to join the European Union. Despite the fact that the 100% support level will be achieved only in 2013 in case of direct payments, and international tendencies are heading to the direction of subsidy reduction, the community agricultural subsidies are the multiple of the amount that the Hungarian agricultural budget could provide."

According to Borszéki (2000), the agricultural financing is determined by the self-financing (depending on the capital need, financial status and fundraising), the credit and support system as external sources, and the general state of economy, while the financing channels of agriculture are: internal capital formation, subsidies and loans.

3.4 Sources and forms of agricultural lending

Agricultural loans take many forms. The credit institutions may finance the different points of product chain, and through the actor on the end of the chain (integrator) the whole product chain (vertical financing); the agricultural enterprise, regardless of the enterprise's purposes, based on its economic situation (global financing); a specific transaction, examining its characteristics and the general economic situation of the company (transaction financing); particular projects, in which the sources of the return are generated by the project itself (project financing). (Francsovics 2005)

Among the institutional actors of agriculture's external financing, the commercial banks, cooperative financial institutions, and the state funded investment, development and (short-term or long-term) working asset loans are the direct, while the suppliers, the integrators, as well as the factoring and leasing companies are the indirect financial sources. The latter banking kind of indirect financial transactions are more expensive, but establish a link between the commercial banks and the high-risk agricultural customers. The non-banking-type indirect forms, which enable external funds, are the supplier credits, customer advances and the companies' loans from members. (Kemény 2010) The role of different financial organizations in agricultural lending can be seen on Figure 1.

In terms of the source structure of agricultural enterprises, the economic size and the type of company are determining. In the larger holdings the share of external financial sources is higher, and thereby the extent of indebtedness as well. In case of smaller farms, due to their small size, the opportunity of connecting to the capital markets is limited, so there is a constraint of self-financing (Varga et al. 1999). The corporate enterprises are rather characterized by bank and supplier financing, while the individual farms get financial resources from integrator firms or by own funds (Kapronczai 2010). In summary, the agricultural credit portfolio is growing, but it is far behind the other sectors of the national economy, and just one-third of it is foreign currency-based (Törőné 2012).

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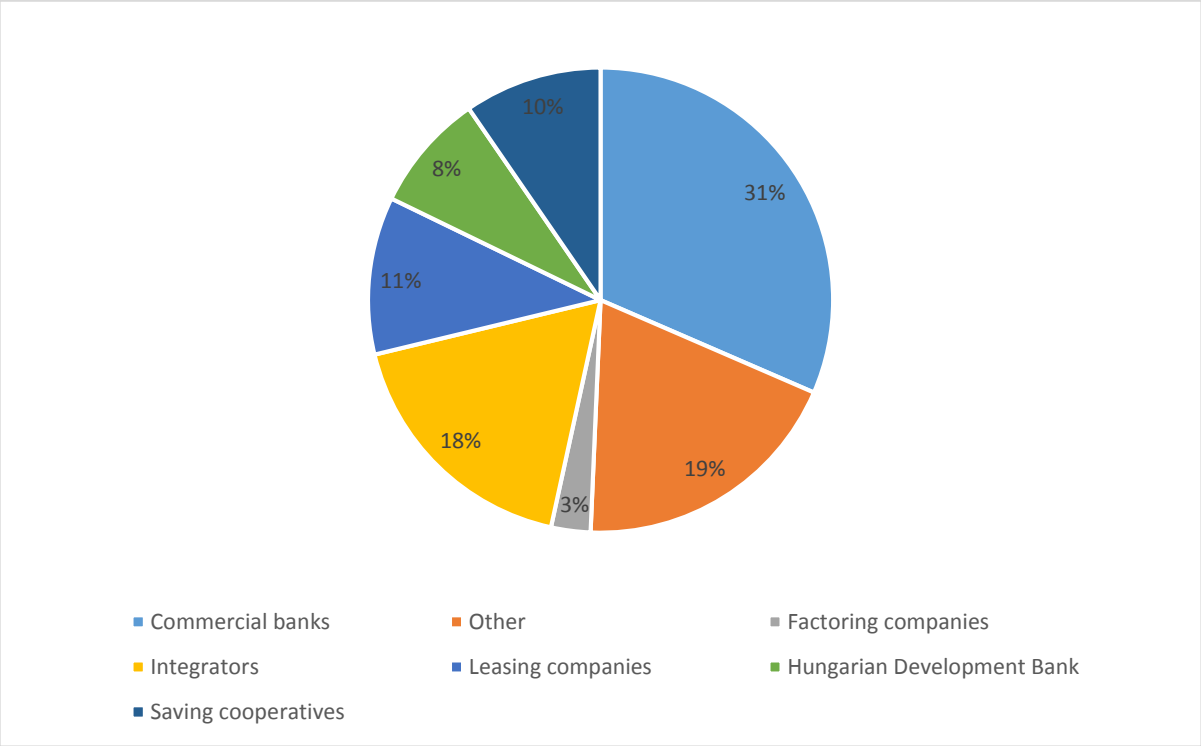
Figure 1: The importance of financial organizations in the agricultural lending



Source: AKI Gazdaságelemzési Igazgatóság, 2013

Just like on the scene of global trade between the various interest groups, conflicts of interest can be observed between the different sectors of national economy, since the profit-oriented banking sector does not consider the repayment of loan and its interests guaranteed in case of credits granted to agricultural producers, and consequently it can not have regard to the nature of public interest of food production (Fertő 2001). The decline in the share of agriculture to GDP caused uncertainty in the sector-financing banks, so the borrower can find itself in a credit assessment situation, in which its creditworthiness and possible guarantees are very strictly evaluated (Lentner 2004).

According to Kiss (2003) the risks of agricultural lendings can be reduced by proper collateral, loan guarantees, government guarantee, and lending with public warehousing. The reduction of risks results in easier and cheaper bank financing, as the value of land property increases due to the improving profitability, and the bank's need for interest margin and surplus collateral decreases. Nevertheless, according to recent researches (Szűcs 2012), the interest support and the system of state guarantees decreased the compulsion of future risk assessment, increased the danger of non-market led development, and worsened the functionality and liquidity of farms by increasing the indebtedness of enterprises and excessive investment incentives. The public warehouse lending was undermined by global economic crisis: as a result of the 2008 price depression after the 2007 price explosion, the coverage disappeared from the credits of the ones who speculated on price increase (Kemény 2010).

3.5 European models of agricultural lending

Based on the conclusions of Tanka (1998) it can be stated that although the economic and financial systems are globalizing, various institutions and mechanisms of agricultural financing emerged in each countries. The main causes of differences – beyond the historical antecedents and traditions – are to be sought in the importance of agriculture in national economy, the type of operated system of financial institutions, the developed practice of

agricultural lending and the extent and methods of state interventions. Based on that, four main financing models can be distinguished in Europe, which do not exclude each other, but function as prevailing model in certain countries or country groups:

1. The major commercial banks with nationwide network lend: United Kingdom, Ireland

2. Network of cooperative agricultural banks: Germany, Netherlands, France, Belgium, Italy, Sweden

3. "Near-state" specialized financial institutions: Italy, Spain, Portugal

4. Corporate credit to finance the technically advanced and high-level intermediate consumption generating agriculture: United Kingdom, Denmark, Netherlands.

The so-called American model is also worth mentioning, in which the groups of institutions that implement the division of labor and at the same time compete with each other, constitute a complex system, thereby improving the farmers' position on the demand side.

Of course, it is crucial to take into consideration the specific conditions when designing the domestic agricultural credit system. Decision makers should not make the mistake to apply in its entirety the financing model of another country without adapting it to local conditions.

3.6 Doubts about the concept of agricultural bank

In Hungary, the concept of specialized financial institution had repeatedly failed, so – in our opinion – its 'resurrection' needs careful, detailed and objective analysis and planning. Until the mid-'90s, the so-called Mutual Support Fund (Kölcsönös Támogatási Alap = KTA) was the main source of agricultural financing, functioning from the financial contributions of cooperatives and large state farms, generally providing lower credit interest than the applicable central interest rate.

The banking service background of the credit-outsorcing was assured by Agrobank, but the suspension of KTA (repayment to the capital owners) in 1995 prevented the further operation of the financial institution and led to its merging into the mostly state-owned Mezőbank. Under the pressure of the commercial banks opening branches following the 1996 OECD accession, and as a consequence of the volatile performance of the agricultural sector, Mezőbank could not avoid its fate. Because of its not sufficiently diversified portfolio and risky lendings, the bank was forced to get capital injection from the state, and later a tender was announced for its privatisation in 1998 which was won by the Austrian Erste AG.

The concept of a state-owned agricultural bank has been a recurring idea since the early '90s, in general carefully planned, when it became obvious that it was still much more economical for the state to finance specific loan schemes, financial products and packages than setting up and maintaining a complete banking network. In the latter case, buying, rebuilding and supplying the real estate with the proper IT and communication infrastructure would generate very high costs, not to mention the training and the proper wages of the required staff, and the corporate identity and marketing expenditures related to the products.

4. Conclusions

We believe that such a financial institution would be exposed to high risk due to its specialized unilateral portfolio, thanks to the specificities of the agricultural sector characterized by a slow return on investment, seasonality, the uncertainties resulting from its

biological nature and the generally characteristic low income levels. Thus, so far, the agricultural lending has been carried out by the Hungarian Development Bank, for the sake of easier and faster communication with the clients through the mediation of commercial banks, in agreement with those on the issues of risks and benefits (lending costs, interest income etc.)

The proposal of the so-called 'green bank' (published in April 2012) refers to a state property of 51% (so majority, but not exclusive ownership), and business investors with market financing according to their proportion. The government should be very careful to avoid the influence of different companies and interest groups on the bank's operation, business policy and thereby the position of clients.

In our view, the 'bottleneck' is the future client: a bank gladly negotiates if it has information on the turnover of the preceding years, the current financial situation and the future plants, so overall about the chances of return and repayment. A client without a bank account, proper accounting, elaborated business concept (like so many primary producers and family farmers) may not be creditworthy. As long as the financial and 'self-management' culture does not change in a positive direction, it is exactly those who need it most that will not benefit from the agricultural bank's advantages.

In addition to the aspects above, it should be also taken into consideration that a new, state support-dependent bank may not solve the problem of agricultural financing in a socially sustainable way, because other sectors already consider agriculture as overcompensated and oversupported, while the contributions (payments) of agricultural actors may not not cover the crediting of medium or large investments, thus, new social tensions may arise, because the required money has to be taken from elsewhere.

According to a possible scenario (pessimistic for most of the agricultural actors) in the long run the European agriculture is expected to move towards a competitive, in-market direction. At the expense of agricultural subsidies, an icreasing priority will be given to technological research and development and other areas of industry and services, and, as a result of the occuring market clearing mechanisms, the disappearance of the small and uncompetitive farms, and the financing needs of the investments of farms with - due to the concentration into bigger farm sizes – decreasing number, but growing size, will encourage the commercial banks to expand their activities in this direction. But if the 'race' starts between the banks for competitive and creditworthy farms of economic scale, adapting modern technologies, then the legitimacy of the agricultural bank, which originally was intended to help the small, undercapitalised farmers who were not able to be equal partners with the commercial banks, bevomes questionable, since its target group partially disappears, partially transforms and 'outgrows' the framework provided by the agricultural bank.

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Controlling as a management system of milk production and consumption in Slovakia and the Czech Republic

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Abstract
As milk and milk production have their irreplaceable role in securing the state self – sufficiency in basic food, it is necessary to pay attention to not only to production, but also to consumption of these products. The milk production is important for the society as a whole, both in terms of economy of state and the employment of rural population. It is a traditional economic sector, that due to its very favourable conditions promises a very viable future.
The primary aim of this article was to point to the development dependencies in production and consumption of cow´s milk with the emphasis on reasons of decline in dairy cows. Furthermore we focused on considering the economy of milk production, where we assessed the own costs to exercise price per one liter of cow´s milk, calculation of profitability of production of milk without benefits. We performed the research both within the conditions of the Slovak Republic and the Czech Republic.

Key words: *costs, milk consumption, milk production, prices, self – sufficiency*

JEL classification: *Q19*

1. Introduction

The food self-sufficiency of the country is defined as the ability to ensure coverage of domestic food consumption by own production potential. It follows that it is an ability of country to secure the domestic market by food with domestic origin. The rate of food sovereignty is one of the important indicators between countries. It is the fact that after accession of Slovakia to the EU the food sovereignty of Slovakia is steadily decreasing. Based on the above, it has been taken important political decisions, which define the acceptable level of country dependency on imported food and its regular monitoring.

The production of milk is organizationally, materially, economically and in focus of manpower deployment the most demanding livestock sector. Reasons of the cost items fluctuation are mainly different natural, productive, organizational and other conditions. Other reasons are different individual cost items registrations; variability in determination of biological indicators and in some cases the inaccuracy or inability of their exact findings (Bouška, J., 2006)

Currently, there are many discussions about the importance of milk consumption with two opinion groups. First group declares that milk is an essential food; the second group again gives priority to the health aspect of milk. On the other hand, there are also people perceiving diet and nutrition just in concept of “eating and drinking” and people pointing to the increasing trend of diseases linked to the cow’s milk consumption (Michalcová, A., Artimanová, A., Krupová, Z. 2007).

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These last two groups of people are most participating on the worsening of situation in milk and milk products consumption. Slovakia is still lagging behind the global average as the manufacturers and statistics are shoving. One of the main reasons of remaining behind the global average are poor knowledges of the people about the impact of these products on their health, healthy lifestyle and also lack of medial support to buying milk (Gondárová, J., Jelšíková, M. 2010).

2. Methodology and data

Assessment of developments on the Czech and Slovak markets was focused on one of the basic agricultural commodities of both countries, cow's milk. The initial period in which we applied most of analyzes was the period 1998 - 2014. The data source was the domestic and foreign literature, articles, database of Slovstat accessible on the website of the Statistical Office of the Slovak Republic (SR), also "Situational and outlook reports available on the site of the Research Institute of the economics of agricultural and food. Further information is available on the website of the Statistical Office of the Czech Republic (CR) and the Institute of Agricultural Economics and Information. The data in the Czech and Slovak crowns has been converted into euros using the exchange rate applicable for current year. The source of data relating to production cost and exercise price was a database of the Research Institute of Agricultural and Food under the name of Costs and revenues of agricultural companies of SR.

We conducted this research by several methodological procedures. We applied mathematic-statistic methods used in the calculation of the indicators themselves, regression analysis. By analysis, synthesis and comparison of the data, we came to the results, which we processed in text, tabular and graphical form.

In comparing we used indexes, proportional numbers, representing the relative comparison of the indicators in time.

<u>Indices of extensity measuring</u> $$i_{1/0} = q_1/q_0 \quad (1)$$

- Extensities are representing directly detectable variables by measuring, labeled $q_{(0)}$,q_1, (0) – previous period (basic), (1) – current period (actual),
- <u>Absolute increase/decrease</u> $$\Delta_t = Y_t - Y_{t-1} \quad (2)$$

The estimation of future expected developments in production and consumption of milk we have realized through the use of time series. To enable the analysis of the trend, it was necessary to balance time series by suitable trend function. With the help of trend function we determined the prognosis of developments in milk production and consumption for the next two years. For its compilation, it was necessary to perform regression analysis. We applied a linear model which point estimation is a function:

$$y_j = b_0 + b_1 x_j \quad (3)$$

Where: b_0 – intercept

b_1 – regression coefficient

y_j - j-th value of the dependent variable

x_j - j-th value of the independent variable

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3. Results and discussion

3.1 The number of dairy cows, average annual utilization and production of cow's milk in SR and CR

Milk production in the Slovak and the Czech Republic belongs to one of the most important agricultural areas. The reason is particularly suitable natural conditions for dairy farming. Table no. 1 evaluates the development of the cow's milk production; average annual utilization and the number of dairy cows.

In assessing the developments of cow's milk production in Slovakia, we conclude a reduction in cow's milk production by almost 20 %. This decrease is expressed by index value 0.806 between years 2014 - 1998. Cow's milk production in the Czech Republic was during the reference period (1998 - 2014) stable, index value 1.052 even reveals an increase of 5 %. The registered average annual yield for milking cow was increasing in both countries (index SR – 1.519, index CR – 1.593). At the beginning of the considered time period, there was a difference in average annual yield of cow's milk 417 liters in favour of CR. At the end, the difference was already 1 235 liters, because the utilization of dairy cows in Czech republic was growing faster as in Slovakia. It follows that orientation of Czech farmers during the period was on cow's milk production intensity.

Table 1: The number of dairy cows, average annual yield and milk production in SR and CR

	Cow's milk production (mil. l)		Average annual yield on a dairy cow (l)		The difference in average annual yield CR and SR (l)	Dairy cows (pcs)	
	SR	CR	SR	CR		SR	CR
1998	1 142	2 716	3 970	4 387	417	254 384	646 838
1999	1 073	2 736	4 101	5 022	921	250 974	642 026
2000	1 067	2 708	4 664	5 255	591	242 496	614 787
2001	1 052	2 702	4 654	5 589	935	230 379	611 395
2002	1 163	2 728	4 898	5 718	820	230 182	596 295
2003	1 109	2 646	5 029	5 756	727	214 467	590 322
2004	1 047	2 602	5 160	6 006	846	201 725	572 887
2005	1 068	2 739	5 291	6 254	963	198 580	573 724
2006	1 060	2 694	5 422	6 370	948	184 950	563 723
2007	1 043	2 684	5 553	6 548	995	180 207	564 686
2008	1 026	2 728	5 684	6 776	1 092	173854	568 695
2009	929	2 708	5 815	6 870	1 055	162504	559 803
2010	891	2 612	5 946	6 904	958	159260	551 245
2011	901	2 664	6 077	7 128	1 051	154 105	551 536
2012	931	2 741	6 208	7 432	1 225	150 272	551 225
2013	907	2 775	6 339	7 434	1 095	144 875	551 924
2014	921	2 856	6 470	7 705	1 235	143 083	563 963
Index 14/98	0.806	1.052	1.591	1.593	2.962	0.562	0.872
Index 14/13	1.015	1.029	0.997	1.035	1.128	0.988	1.022

Source: Slovstat, Statistical Office of the Czech Republic

Milk cows production in Czech republic was over the analyzed period stable. Production of cow's milk in Slovakia recorded, except of the years 2002, 2005, 2011 and 2012, declining trend. The lowest milk production in Czech republic was recorded in year 2004, the highest in the last year of analyzed period (2 856 mil. l). There wasn't the maximal dairy cows number in the year 2014 but maximal average annual yield on a dairy cow. On the contrary the

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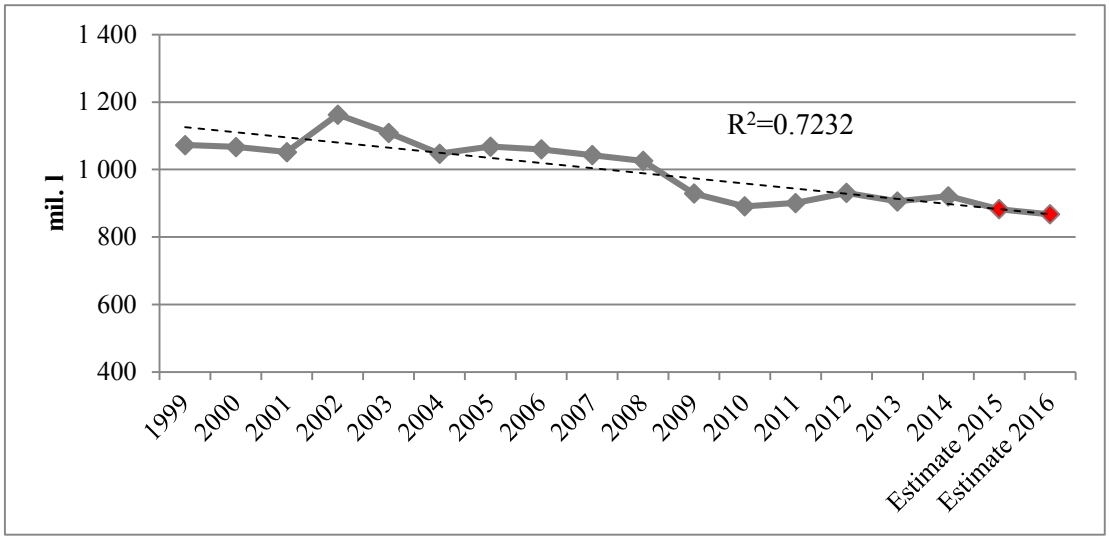
highest milk production in Slovakia was recorded in the first year of the observed period (1998). In this year we recorded also the maximal number of dairy cows.

The lowest milk production was recorded in year 2011, despite of the number of dairy cows wasn't the lowest. The difference in milk production between these two years was more than 21.06 %. One of the reasons of milk production decrease was the average yearly dairy cows decrease of more than 7 000 pcs. From April 2015, milk quotas, limits in milk production, were stopped in EU countries. Slovakia did not fulfill the milk quotas in last years, so it is in another position as countries with milk overproduction. Positive is, that the average annual milk yield in Slovakia was increasing in spite of decreasing number of dairy cows, same as in Czech republic. Increase in cows milk yield is compensated by decrease in dairy cows number in CR but not in SR. The highest increase of milk yield in Slovakia (5.88 %) was recorded in 2011 and 2012 in Czech republic in 2000 and 2001 (6.37 %). Increasing milk production leads to decrease in production cost per unit of output. This is one of the ways to increase the profitability of milk production. To increase the dairy cows utilization, it is necessary to focus on roughages quality, productive and reproductive parameters improvement, young cattle breeding and technologies upgrading.

3.1.1 Estimation of the cow's milk production in SR and CR

Estimate milk production, we conducted by regression analysis. The results indicate the further decline in production of cow's milk with probability of 72,32 % in SR.

Graf 1: Estimation of the cow's milk production in SR



Source: own processing

Estimated production of cow's milk in Czech Republic is more positive than the estimation in Slovak Republic. However, linear model explains only 25.16 % of change. The production of cow's milk is given not only by time series but also by other factors not considered by the model. The above estimates show that the Czech Republic has a much more positive result estimate of the expected development of future milk production than the Slovak Republic.

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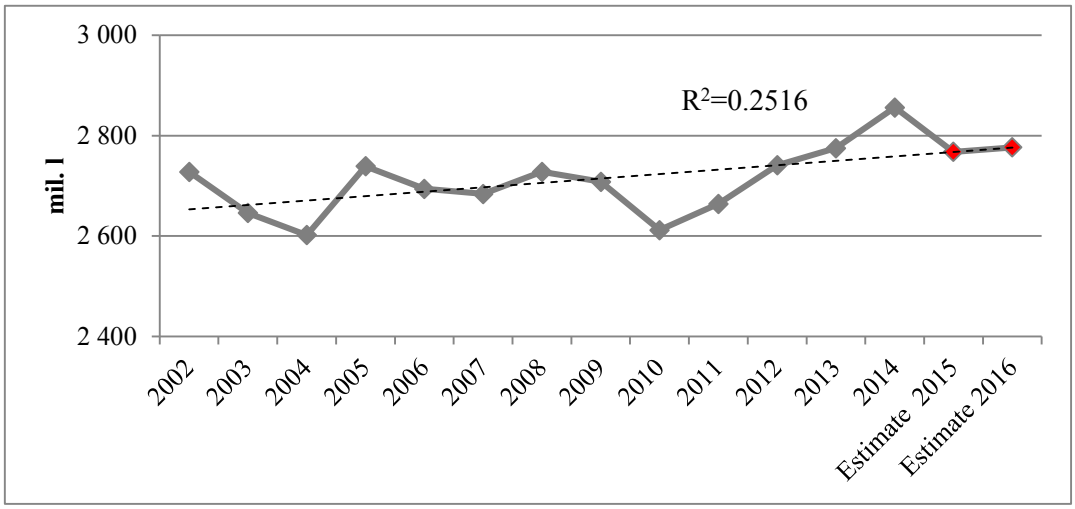
Graf 2: Estimation of the cow's milk production in CR



Source: own processing

From the perspective of milk and dairy products consumption per capita, there is considerable difference between countries. Recalculated milk consumption per capita of the Czech Republic significantly exceeds the consumption of milk per capita of the Slovak Republic. In 1998, the consumption of milk per capita in Slovakia was 157.8 liters, while in the Czech Republic it was 191.4 liters.

3.2 Consumption of cow's milk in SR and CR

Milk consumption development in both countries had fluctuating tendency. From 1998 to 2014 there was an increase in milk consumption per capita. While in 1998, consumption per capita of the Slovak Republic represented 157.8 liters in 2014 it was 160.6 liters, which means an increase of only 1.8 % (index 1.018). The statistics below shows that consumption of milk per capita has stagnated and is far below the recommended dose, which is determined by nutritionists to 220 liters. Milk consumption per capita of the Czech Republic reports growth, which achieves over the level of recommended consumption from 2004.

It is generally known that the Slovak and Czech households prefer life milk before fresh. Within life milk is the most popular type the semi-skimmed milk, which takes majority share in the volume of milk consumption.

The reason for the low milk consumption in Slovakia can be caused by low purchasing power of the households, which is reflected from consumer prices of milk and also the monthly households income. The decrease in VAT from 20 % to 10 % resulting in price reduction of milk and dairy products will contribute to the increase of milk and dairy products consumption to the level of neighboring countries, that have lower VAT on food as the Slovak Republic.

Further important factor, which is weakening the competitiveness of Slovak milk producers, is unused production capacity of the dairy industry. The average usage of production capacity 40 – 60 %, as stated in the Green Reports of Ministry of Agriculture and Rural Development, affects the growth of unit costs in the production of domestic products.

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Table 2: Cow's milk consumption in SR and CR

	Average number of inhabitance (thousands)		Cow's milk consumption per inhabitant (l)		Total cow's milk consumption (l)	
	SR	CR	SR	CR	SR	CR
1998	5 391	10 295	157.8	191.4	850.68	1969.43
1999	5 399	10 283	156.7	201.3	845.45	2068.98
2000	5 401	10 273	155.6	207.9	840.35	2134.41
2001	5 380	10 224	157.1	208.8	845.16	2131.10
2002	5 379	10 201	161.4	214.2	868.14	2185.54
2003	5 379	10 202	153.7	216.9	826.74	2214.86
2004	5 382	10 207	148.9	223.3	801.47	2282.25
2005	5 387	10 234	150.2	231.4	809.17	2372.10
2006	5 391	10 267	148.0	232.4	797.90	2390.74
2007	5 396	10 323	148.9	237.5	803.73	2465.52
2008	5 407	10 430	148.6	235.6	803.48	2466.15
2009	5 418	10 491	149.4	242.4	809.51	2546.85
2010	5 431	10 517	158.1	236.9	858.64	2495.21
2011	5 438	10 497	152.4	221.1	822.71	2322.75
2012	5 408	10 509	154.0	227.5	832.77	2392.42
2013	5 413	10 511	153.9	227.3	833.12	2389.47
2014	5 419	10 525	160.6	229.6	870.24	2419.59
Index 14/98	1.005	1.022	1.018	1.200	1.023	1.229
Index14/13	1.001	1.001	1.044	1.010	1.045	1.013

Source: Slovstat, Statistical Office of the Czech Republic

In comparison to other European countries, Slovakia lags in the consumption of milk per capita, even though the quality of Slovak milk is comparable in terms of fat and nutrients with other European countries. Despite of the national efforts to promote the consumption of milk and milk products through programs such as "School Milk" or "Promotional and informational program to promote consumption of milk and milk products", the milk consumption remains sluggish. Since 1957 the third May Tuesday is declared as "World Day of milk", to commemorate the importance of its consumption.

3.3 The difference in cow's milk production and consumption in SR and CR

Table 3 shows the differences between production and consumption of milk in the reporting period. These figures indicate that both countries produce more milk than domestic consumption. In 1998 the Slovak Republic has produced surplus of milk at the level of 34.24 % and the Czech Republic 37.89 %. The production surplus was declining and in 2014 it reached the value of 5.83 % in SR and 18.06 % in CR. If we recalculate the surplus in milk production to domestic consumption per capita, we will find that the Slovak Republic produces about 9.37 liters more, and the Czech Republic about 41.46 liters more milk. Slovak Republic currently does not produce sufficient milk to cover the recommended dose (220 to 160.6 = 59.4) of milk consumption. The analyzes show that the Czech Republic is in the production and consumption of milk in terms of the needs of the population in a much better situation than the Slovak Republic.

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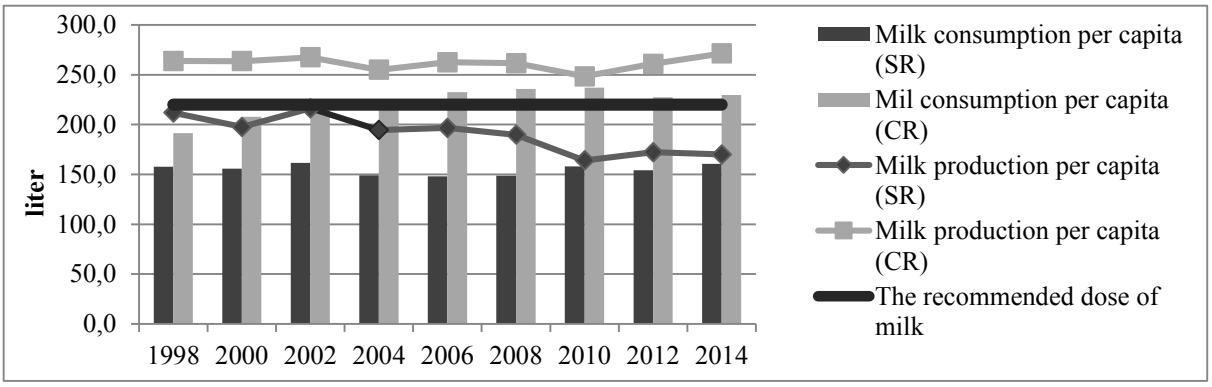
Table 3: Difference between cow's milk production and consumption

	Difference between cow's milk production and consumption (mil. l)		Cow's milk surplus per capita (l)		Cow's milk surplus per capita (%)	
	SR	ČR	SR	ČR	SR	ČR
1998	291.32	746.57	54.04	72.52	34.24%	37.89%
1999	227.55	667.02	42.15	64.87	26.90%	32.22%
2000	226.65	573.59	41.97	55.83	26.97%	26.86%
2001	206.84	570.9	38.45	55.84	24.47%	26.74%
2002	294.86	542.46	54.82	53.18	33.96%	24.83%
2003	282.26	431.14	52.47	42.26	34.14%	19.48%
2004	245.53	319.75	45.62	31.33	30.64%	14.03%
2005	258.83	366.9	48.05	35.85	31.99%	15.49%
2006	262.1	303.26	48.62	29.54	32.85%	12.71%
2007	239.27	218.48	44.34	21.16	29.78%	8.91%
2008	222.52	261.85	41.15	25.11	27.70%	10.66%
2009	119.49	161.15	22.06	15.36	14.76%	6.34%
2010	32.36	116.79	5.96	11.10	3.77%	4.69%
2011	78.29	341.25	14.40	32.51	9.45%	14.70%
2012	98.23	348.58	18.16	33.17	11.80%	14.58%
2013	73.88	385.53	13.65	36.68	8.87%	16.14%
2014	50.76	436.41	9.37	41.46	5.83%	18.06%
Index 14/98	0.174	0.585	0.173	0.572	0.170	0.477
Index 14/13	0.687	1.132	0.686	1.130	0.658	1.119

Source: own calculations

Graf 3: Comparison of cow's milk production and consumption pre capita to the recommended dose



Source: own processing

In Chart 3 we would like to point out that the milk producers in the Slovak Republic were not able to produce milk per capita at the level of recommended dose (220 litres), while farmers in the Czech Republic has succeeded this in each year. It follows that if the consumption of milk were at the recommended dose, we would have to import milk from other states.

3.4 Economics of cow's milk production in SR and CR

Own cost of 1 liter of milk, as well as exercise prices per 1 liter of milk in the Czech Republic were not available in all analyzed years, so we have to work with data that we have available.

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Table 4: Own expense, exercise price, profit and return on cow's milk in SR and CR

	Own expense (€/l)		Realization price (€/l)		Profit/Loss (€/l)		Return on costs (%)	
	SR	CR	SR	CR	SR	CR	SR	CR
1999	0.201	-	0.182	-	-0.019	-	-9.401	-
2000	0.208	-	0.191	-	-0.018	-	-8.624	-
2001	0.220	-	0.206	-	-0.014	-	-6.277	-
2002	0.226	0.247	0.223	0.258	-0.003	0.012	-1.278	4.738
2003	0.225	0.235	0.217	0.242	-0.008	0.006	-3.452	2.621
2004	0.258	0.260	0.237	0.266	-0.021	0.006	-8.116	2.276
2005	0.263	0.279	0.250	0.286	-0.013	0.006	-5.110	2.222
2006	0.305	0.291	0.270	0.287	-0.035	-0.004	-11.333	-1.500
2007	0.328	0.323	0.290	0.322	-0.038	0.000	-11.525	-0.116
2008	0.405	0.327	0.361	0.319	-0.044	-0.007	-10.820	-2.278
2009	0.370	0.307	0.350	0.236	-0.020	-0.070	-5.405	-22.906
2010	0.390	0.312	0.290	0.291	-0.100	-0.021	-25.641	-6.642
2011	0.430	0.315	0.390	0.313	-0.040	-0.001	-9.302	-0.474
2012	0.400	0.319	0.310	0.298	-0.090	-0.021	-22.500	-6.475
2013	0.420	0.313	0.340	0.316	-0.080	0.003	-19.048	1.049
2014	0.420	0.302	0.350	0.345	-0.070	0.043	-16.667	14.200
Average	-	-	-	-	-0.038	-0.004	-10.906	-1.022

Source: Research Institute of the Economics of Agriculture and Food, Institute of Agricultural Economics and Information, own calculations

A comparison of production cost per liter of milk in the Czech Republic and Slovakia showed that from 2002 to 2007, the cost of both countries maintained at approximately the same level. In other years has costs in terms of the Czech Republic reached a lower level than in Slovakia, which is due to the higher efficiency of dairy cows since 2008 of about 1 000 and more liters of milk per cow.

This fact in dairy cows has a decisive impact on the unit cost of milk production in both countries. Despite the implementation of various measures for the maximum savings an increase of cost occurred. From 2002 to 2013, their own cost of 1 liter of milk in the Czech Republic increased by only 0.055 €, which represents a growth of 23 %, while in Slovakia up to 0.194 €, which is growth of 86 %.

From the perspective of the individual cost items representation in percentage in total own costs for one liter of milk either in Slovakia or the Czech Republic held the top positions food and bedding, whether produced or purchased. The high level of the cost of these items is due to the constant increase in input prices. Significant cost item consists of the direct wages and salaries as well as depreciation of animals. Increasing the productive life of dairy cows can reduce the value of this cost item.

When analyzing the data concerning the Slovak Republic it can be said, that own expenses in all the analyzed period exceeds the exercise price level. As can be seen in Table 4 realization prices of milk without a subsidy were not able to cover the costs necessary for its production. Producers generated a loss in the range of 0.003 to 0.100 € per liter of milk and the average loss over the reporting period of 16 years was 0.038 €. Return on own costs amounted in all assessed periods negative value, while the average return costs stood at -10.906 %.

When analyzing the data related to the Czech Republic we can say that between own costs and the exercise price are not as great differences as in the case of the Slovak Republic. The average return over the evaluated years has been at -1.022 %.

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3.5 Suggesting possible solution of subsidies per average cow for milk producers

The calculations suggest that the Slovak farmers were in the investigated years in the loss of milk production, as noted in Table 5. The economic imbalance should be addressed through subsidy titles. If we evaluate the past three years, the subsidy should amount to around 500 € for the average dairy cow. Loss per milking cow was calculated by multiplying the milk yield of dairy cows and economic loss rates expressed in euro per liter of produced milk.

Table 5: Difference between own costs and exercise price per milking cow in SR (€)

Year	2007	2008	2009	2010	2011	2012	2013	2014
Loss per cow's milk (SR)	-210.00	-249.05	-249.05	-594.60	-243.08	-558.72	-507.12	-452.90

Source: own calculations

In this part of the article we addressed further possible solutions of subsidies per average cow for milk producers (farmers).

The first variant is based on the average annual yield of the cows in SR, which does not reflect the exact value of subsidies to individual breeds. This is because of different milk yield in separate farms, which ranges from 4 500 to 10 000 liters. The second alternative could be carried out on the basis of the actual average annual yield by breeds that would reflect the economic subsidy for breeding more objectively. Third Solution variant of subsidies is presented in Table 6. It is based on the change of average yield and average exercise price and its impact on economic efficiency of milk production in Slovakia.

Table 6: Impact of the change in exercise price on economic efficiency of dairy cows breed in SR

Exercise price (€/l)	0.25	0.26	0.27	0.28	0.29	0.3	0.31	0.32	0.33
Total difference in € to average yield	-	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7
Average loss/profit per dairy cow (€)	-	-1035.2	-970.5	-905.8	-841.1	-776.4	-711.7	-647	-582.3
Exercise price (€/l)	0.34	**0.35**	0.36	0.37	0.38	0.39	0.4	0.41	0.42
Total difference in € to average yield	64.7	**64.7**	64.7	64.7	64.7	64.7	64.7	64.7	64.7
Average loss/profit per dairy cow (€)	-517.6	**-452.9**	-388.2	-323.5	-258.8	-194.1	-129.4	-64.7	0

Source: own calculations

In 2014, the average dairy cows yield in SR was 6 470 liters and average exercise price was 0.35 €/l. In table we are assessing the impact of the change in farming exercise price of 0.01 € on loss/profit of average dairy cow, which is economically expressed by the multiplication of yield and above mentioned price change (6 470 * € 0.01 = 64.7 €). The subsidy per an average dairy cow, the state should pay according to the actual achieved average exercise price of milk in the Slovak Republic and the average yield of dairy cows in individual breeds.

4. Conclusion

From the results of the analysis we can conclude that in the Czech Republic and Slovakia remains a long-term economic imbalances (loss) for breeding dairy cows, which affects the continuing reduction of livestock number. Farmers are replacing the reduction in number of dairy cows by a higher efficiency of dairy cows, which ensures adequate milk production for each country. From the perspective of self-sufficiency is Czech Republic in better position.

The milk production surplus to domestic consumption in CR is 18.06 % or 41 liters. In SR the milk production surplus is 5.83 % per capita.

The Czech dairy farmers had in 1998 about 417 liters bigger yield in milk production per dairy cow. In 2014, the difference in milk yield between the Czech and Slovak Republics was already 1 235 liters of milk per dairy cow. It follows that Czech farmers bet on higher milk production intensity, which later manifested by reducing the unit cost of one produced liter of milk. This has a major impact after 2008, when the own costs on one produced liter of milk reached 0.42 € in Slovakia and in the Czech Republic it stagnated at 0.31 €.

Based on the long-term development and its predictions the self-sufficiency of the Slovak Republic in milk production threatened. One of the options to avoid this production risk is government assistance, which would provide targeted support to milk producers on the basis of changes in the exercise price and the milk yield of dairy cows in farms.

If we evaluate the exercise price of milk to its own costs and achieved average annual yield of dairy cows, we can say that milk production on an average dairy cow in Slovak farms was in evaluated period mostly unprofitable. This fact has an impact on a much higher decline of dairy cows number in Slovakia (index 14/98 – 56.2 %) than in the Czech Republic, where the index is 87.2 %. Loss of dairy cows number in the years 1998 - 2014 was in relative terms 31 % faster in Slovakia as in Czech Republic.

In 2016 Slovakia reduced the VAT for milk by 10 %. By mentioned measure Slovakia intends to promote the consumption of basic foods in the population and reduce cross-border shopping of food in neighboring countries. The effect of state intervention in the final commodities prices may cause an increase in milk consumption per capita and Slovak farmers will not be able to cover this increase by domestic production.

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Financing large-scale wind parks through the cooperative financial sector

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Abstract
While the focus in the early days of wind farms was on coastal sites, given technical progress today operating wind energy plants is also economically viable in other rural regions. Technological progress has led to an on-going increase in the output of wind turbines. The size of wind farms is also gradually increasing, which leads overall to larger financing volumes that the small regionally organized cooperative banks can only muster with assistance from a cooperative central bank. The local banks are support by experts in the field of renewable energy from the cooperative central bank – irrespective of whether one wind turbine or an entire wind farm is to be financed. For example, large-size wind-farm financing packages – and in the case of five turbines this can swiftly exceed 20 million euros – can be handled as a financing consortium consisting of the cooperative bank and the central bank. Alongside long-term loan financing and reliance on the relevant government subsidies, the range of services also includes variable financing forms, and this extends to interest and exchange-rate hedges. Financing individual wind farms tends to be structured as project financing, meaning that a closed-end investment project is launched that constitutes a single economic and legal entity. The debt is exclusively serviced from the wind plant's cash flow. Depending on the expertise and needs of the regional cooperative bank, the central bank supports it in all project phases as regards financing one or several wind plants or farms. Rural cooperative banks can only manage to finance large-size wind projects through collaboration between the decentralized cooperative banks and the cooperative central bank. Financing large-size wind farms by cooperative banks will be compared below to other private-sector or government-supported forms of bank financing in Germany and the differences identified.

Keywords: *Cooperative Banks, Energy, Project Finance, Wind Parks*

JEL Classification: *G21, G32, P13, Q20*

1. Introduction – an historical outline

By the end of 2020 in Germany, or so one of the Federal government's plans, at least every third Kilowatt hour will be generated from solar, wind power, hydropower and biomass sources. In the wake of the Fukushima disaster, there was a general social consensus to approve the Energy Reform. Wind power is expected to be the single largest source of electricity, a technology that for many years was highly controversial (Kohler, 2013).

This was not always the case. In former times it was a matter of course. In 1882, or so the statistics of the German Reich reveal, there were still 18,901 wind mills in operation and they exuded, as recorded for posterity in thousands of Romantic oil paintings, the authority of calm rural life. The impressive figure was actually the maximum achieved in history. The construction and operation of the mills was for many years subject to regulatory supervision by the feudal overlords and the Church, but in the 19th century the demand for milled grains to feed the rapidly growing population led to regulations being relaxed. The number of wind mills thereupon swiftly reached record heights – until the steam engine took the wind out of their sails. By the end of the 19th century the first flour mills had been erected and these factories led to the swift demise of their wind-driven counterparts. Alongside the wind mills, the "pure" wind turbines continued to advance. In 1853, American mechanic Daniel Halladay

designed his first model, and blazed the trail. Up to eight paddle-shaped vanes formed a wheel that was mounted on a vertical rotating axis and was outfitted with an additional horizontal vane that automatically aligned the wheel optimally to the wind. Halladay's U.S. Wind Engine & Pump Company in Illinois flourished and in 1876 achieved its international breakthrough at the World Expo in Philadelphia. Technology transfer to Europe commenced. In the United States and Australia there were millions of such small wind turbines in operations by the early 20th century. Their energy was primarily used to pump water, but also to generate electricity. It became ever more popular to generate precious electricity using wind power (Kriener, 2012).

With post-War reconstruction, the demand for energy in Europe soared. Denmark, England, France and the Netherlands pressed the pedal on researching wind power until, in the 1950s, the enthusiasm for atomic energy steamrollered the efforts. An increasing amount of money was committed to researching atomic power, which by 1979 accounts for 60 percent of total research budgets. Only a few crumbs were left over to fund research on solar, wind, etc., namely a paltry four percent. Since the turn of the new millennium, wind power has experienced a heyday. The number of wind power plants had surged at breath-taking speed. In the record years of 2001 and 2002 a total of 4,407 wind turbines were installed in Germany. Meanwhile, offshore wind farms gradually became generally acceptable. Wind power, controversial for decades, emerged as a main pillar of the Atomic Exit, be it in the form of land-based or offshore wind farms. Since the turbines have become quieter and more eco-friendly, and the distances to residential areas greater, so society has come to accept them. Today, 94 percent of Germans, or so the latest Infratest survey shows, support the further expansion of renewable energy and feel it is important. It would seem that the Germans have rediscovered their erstwhile love of the wind mill (Kriener, 2012).

2. Status quo – Investments in Wind power in Europe

With a total of 12.8 GW connected capacity in 2015, wind power accounts for 44 percent of the total newly installed energy generating capacity in the 28 EU member states. Of the figure 9,766 MW was located on land, and 3,034 MW offshore. Compared to the prior year, this amounts to a 6.3 percent increase in newly installed capacity. The cumulative capacity at the end of 2015 came to 142 GW, meaning that wind power covered 11.4 percent of the European electricity requirement (European Wind Energy Association, The [EWEA], 2016). "These numbers show that wind is the driving force behind the EU's energy transition. Wind energy is a mature industry. It makes economic sense and is contributing significantly to Europe's energy security and competitiveness goals," comments Giles Dickson, CEO of the European Wind Energy Association (Bundesverband WindEnergie [BWE], 2016a).

New renewable energy generating plant installed in 2015 provided total capacity of 22.3 GW and thus 77 percent of the newly installed capacity for all technologies. Investments in the new onshore and offshore wind parks rose to a record EUR 26.4 billion, up 40 percent on the 2014 figure. Almost half the new installations in 2015 took place in Germany. Poland and France followed with new installed capacity of 1.3 GW and 1 GW respectively (European Wind Energy Association, The [EWEA], 2016).

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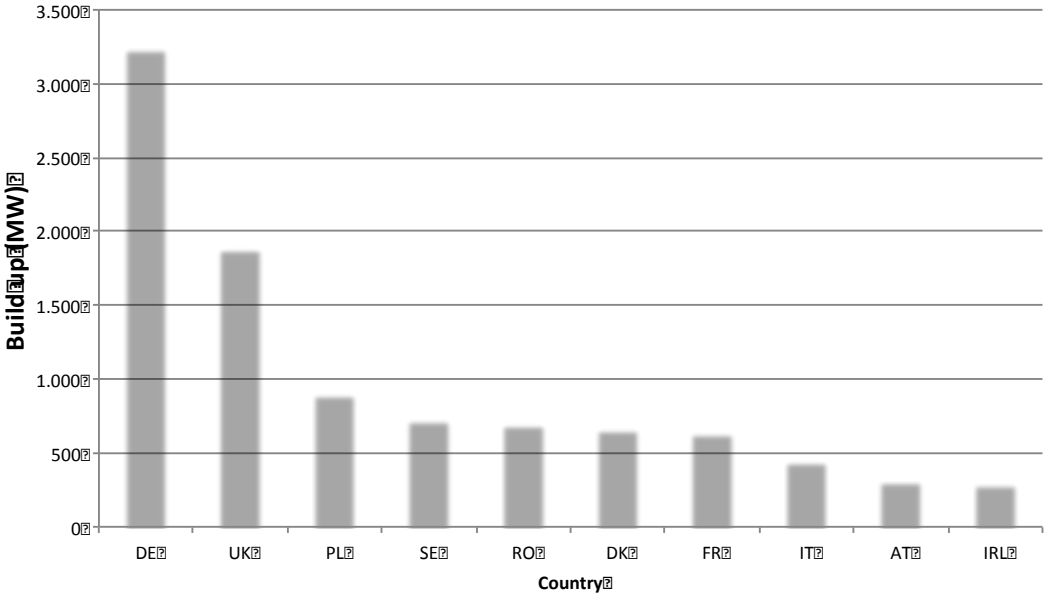
Figure 1: Build up (MW) worldwide in 2013



Source: Bundesverband WindEnergie [BWE], 2016a

Dickson said (Bundesverband WindEnergie [BWE], 2016b): "We've seen strong expansion in Germany in 2015 and a strong year for offshore wind. But growth is uneven geographically. We're not doing as well in countries where the policy and regulation is unclear and/or ineffective – investors and developers go elsewhere. Policy is key, especially when we look at the longer term. As of now only 6 out of the 28 EU states have clear targets and policies in place for renewables post-2020. We see more ambition in emerging economies - which puts a question mark by the EU's goal to be No. 1 in renewables. The Commission's proposal for a new Renewable Energy Directive, due in December, is a key opportunity to drive greater ambition from member states in the absence of binding national targets."

As regards the wind industry, the following key figures obtain for Germany: In 2015 it was the single largest market in Europe and the third largest world-wide (after China and the USA), with total sales of EUR 11.8 billion and a payroll of 150 thousand. Manufacturers from Germany hold an excellent position in the world market, accounting for a share of over 20 percent. About two thirds or some 66 percent of their output was exported in 2015. The following overview indicates that the growth trend continues unabated in Germany (Bundesverband WindEnergie [BWE], 2016a).

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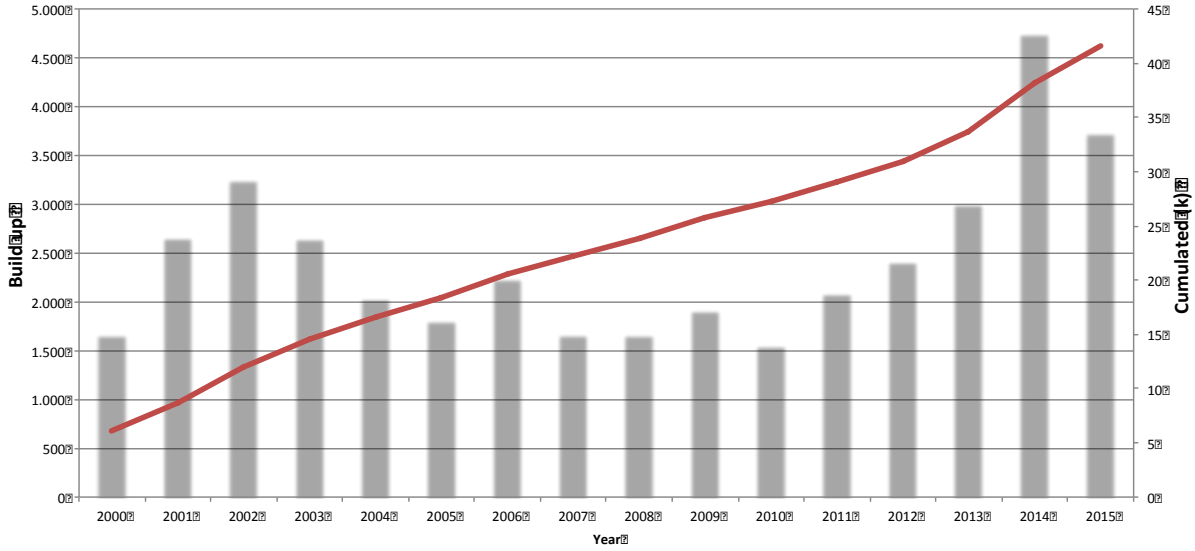
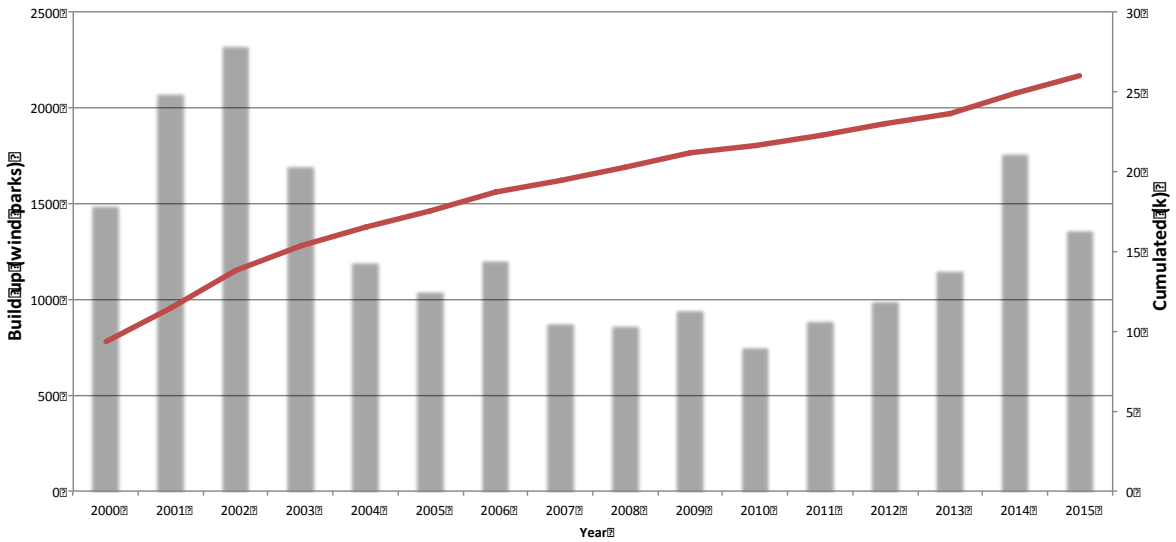
Figure 2: Increase of MW-output in Germany (wind power)



Source: Bundesverband WindEnergie [BWE], 2016a

Industry estimates indicate, for example, that the global market for onshore wind power in 2015 saw substantial growth of at least 55,000 MW, which translates into an increase of more than ten percent on the year (50,000 MW). These numbers highlight the potential and importance of the wind industry and also point to the fact that we can expect an immense financing demand in the future (Bundesverband WindEnergie [BWE], 2016a).

Figure 3: Increase wind parks in Germany



Source: Bundesverband WindEnergie [BWE], 2016a

The chart shows quite clearly that growth rates for wind power plants may not be as strong as at the beginning of the millennium, but that there is nevertheless a persistent increased in the wind energy output generated. One reason for this is that wind power systems have become ever more powerful as a result of technological progress in the sector.

The number of employees in the wind industry likewise continues to head North unperturbed. An ever greater number of new wind-energy-generating technologies coupled with the further expansion in the field of renewable energy could offset the loss of jobs in other industries. It

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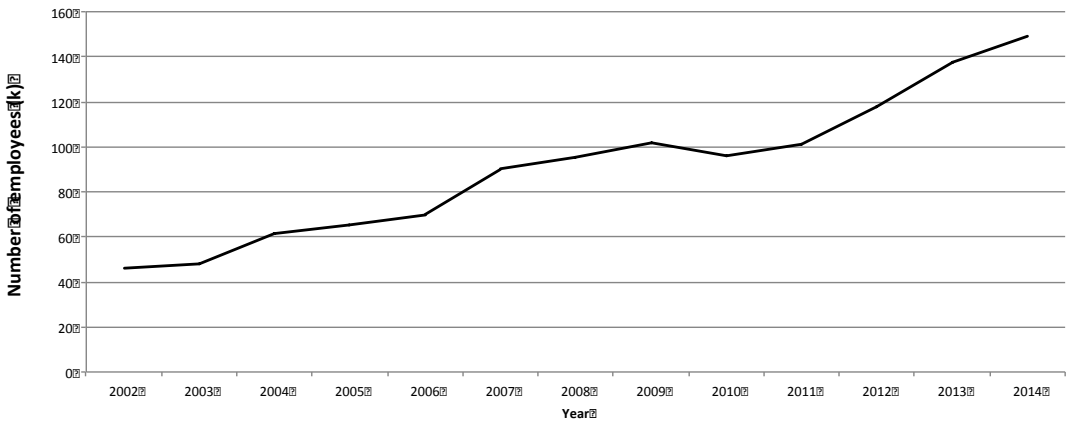
is hard to ignore the macro political importance of the sector for an economy. We have not factored into these figures associated segments, such as the need for skilled staff in financing or those required for recycling wind turbines.

Figure 4: Employees in wind industry in Germnay



Source: Bundesverband WindEnergie [BWE], 2016a

3. Financing requirement for wind power

3.1 Financing a wind energy project

Almost all wind power plants or wind parks are financed by relying on so-called project financing. In other words, an (energy) company or a certain group of persons sets up a special project vehicle (SPV) to finance a specific wind park, and the SPV is exclusively responsible for operating and financing the wind park and can also be made liable for it.

The special thing here is that the lender is only able to rely on future cash flows, assets and project rights when undertaking its due diligence / assessment of the project's creditworthiness (Kuttig & Matthes 2003). In other words, the once-off financing of the equity capital and the debt will in future only be offset by the current revenues from the wind project. The SPV has only this future cash flow to draw on for the repayment of the principal and for the future interest redemptions (Tytko, 2003).

The only collateral available is the assets of the SPV established and the future cash flows. The SPV's sole assets are the wind power plant itself. Those assets are not particularly mobile, meaning that once the plant has been erected it can only be moved elsewhere at a great financial cost. Moreover, there is no market for wind power plants as these swiftly age given technological progress and for this reason there is little demand for existing wind energy plants. For these reasons the SPV's actual asset is not fungible and thus the lender can hardly put a value on it. In other words, the expected future cash flows from the wind power plant are just about the only asset that the SPV can present (Lange, 2011).

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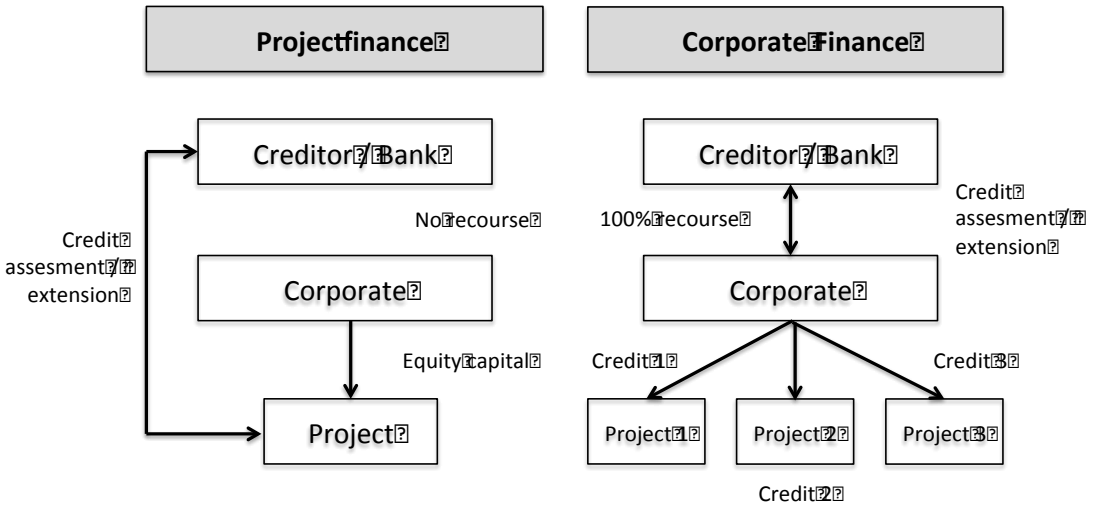
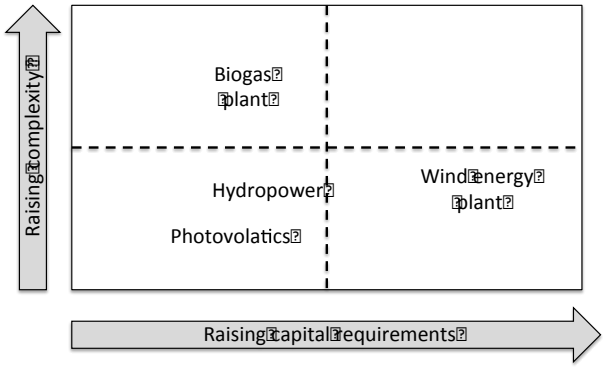
Figure 5: Specific features of a project finance process



Moreover, financing wind energy plants entails a complex type of financing compared to financing schemes for other energy projects, and it moreover involves a high capital requirement.

Figure 6: Financing wind plant in the context of other renewables



Source Data from: Lange, 2011.

3.2 Agribusiness as the Cooperative banks' operating environment

In line with principles of self-help, self-administration and self-responsibility, in 1850 Hermann Schulze Delitsch founded the first "Vorschussverein" or credit association, the precursor of today's Cooperative banks (BVR, 2008). At the same time, Friedrich Wilhelm Raiffeisen discerned the need to develop a model for farmers who had no financial resources in order to enable them to purchase production goods at an affordable price. The cooperative idea thus had its roots in both the agriculture and financing sectors. In agribusiness the Cooperative banks were able to rely on long-standing customer relationships. Cooperation with this clientele was based on the notion of reliable partners. Moreover, the rising demand for foodstuffs, the enduring organic farming boom and the increasing importance of regenerative raw materials all constitute interesting future alternatives for agricultural corporations (Raiffeisen, 1987).

Operating a biogas plant, maintaining and updating a solar PV plant, or handling the design of a wind turbine project on one's own land all require that a farmer today have specialist knowledge and be able to handle dynamic risk management. A bank's success in this segment will therefore centre crucially on how they judge the farmer's management skills. The

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assessment will rest on the recognition that it has not been the classic lending approval criteria that have hitherto countered for the success of an investment in renewable energy, e.g., a high share of own land used to generate the substrate required for the biogas plant, or a high equity gearing for wind turbines. Instead what has counted has been the farmer's flexibility and risk management prowess as proven in managing his farm up until that point.

Agribusiness already relies on product and process innovations to tap new markets. Be it electricity generation from renewable sources such as wind power or biogas plants, or the exploitation of regenerative raw materials, such as bio-degradable packaging materials made from corn starch that will in future replace the customary polystyrene chips. Moreover, farmers are booking additional revenue from services for local communities, forestry work, direct marketing of products, and even tourism. This large number of different fields of activity gives the sector the scope to respond flexibly to changes in the market. All the external factors involved lead to ever more pronounced volatility in the markets, to ever more complex investments, and to ever greater challenges from entrepreneurial activity. A cooperative bank must seize these changes with enthusiasm and be understanding and supportive to successfully accompany agribusiness into the future (Ederle, 2012).

3.3 Financing wind parks by a Cooperative bank

For a regional Cooperative bank, this form of financing for wind energy systems usually seems problematic as the projects tend to exceed the normal financing volume handled by a Cooperative bank. Moreover, rating the risk of financing based purely on cash flow is a problem that can exclusively be handled by specialists. Such valuation expertise can hardly be provided by a small Cooperative bank – or only at disproportionate expense. This is especially true of Cooperative banks in rural regions that still are small organizations compared to their cousins in the cities. However, precisely these Cooperative banks are interested in providing the financing as the wind parks are exclusively erected in less densely populated areas. And this is the specific advantage of the small, regionally geared Cooperative banks based in rural areas. There, existing business relationships with the local population are very important. The Cooperative bank is thus one of the first to hear whether farming land is being tendered as a wind energy zone and whether local farmers are considering releasing fields for use as a wind park.

Today, the decision for or against a bank depends on the latter's lived interest in agriculture. A clear accounts management strategy, networking with local and regional opinion-makers in the agribusiness, suitable products and a focused approach to agricultural clients are all key factors influencing successful market development.

This dieses between proximity to the client and existing client relationships, on the one hand, and the limited ability to shoulder financing for large-scale projects and to put the processual framework for precisely such loans approvals in place, on the other, is solved thanks to the cooperation financial system. For such undertakings all the individual Cooperative banks work together with a cooperative central bank, in which they themselves hold a stake. That central bank supports the Cooperative banks not only in locking into economies of scale (such as for payments transactions and foreign business) but also precisely for the type of project financing outlined above. The following chart illustrates how the process of financing a wind park could be managed by a Cooperative bank with the support of its central bank:

Figure 7: Project financing with the cooperative central bank

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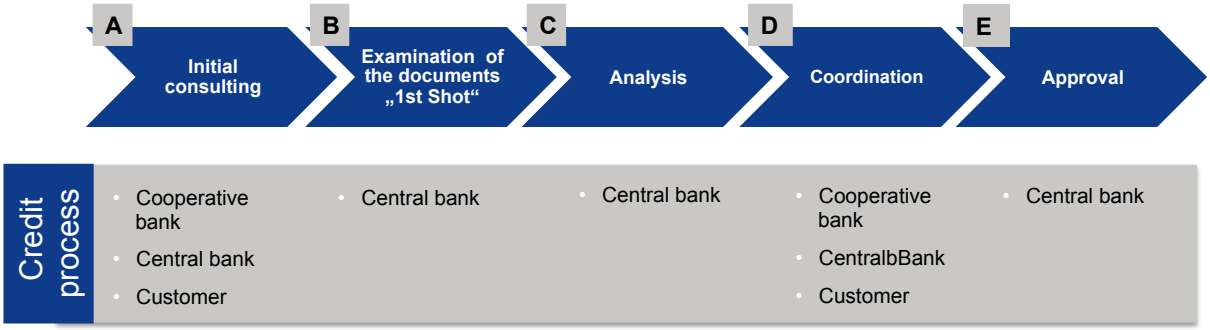

Such collaboration makes sense not only with the pure financing of agribusiness projects, but also when it comes to expertise over the project's life time and to providing consultancy and sales of cross-selling products. For example, structured products, such as derivatives to hedge interest or foreign exchange risks can be marketed with the long-standing experience of the central banks – by the respective Cooperative bank. Project financing of wind power plants constitutes exactly such a product as goes beyond the Cooperative bank's basic business line, in particular if one bears in mind that the wind industry also profits from the cash-flows from exports.

Moreover, government grants and subsidies presume an applications and management process that a single rural Cooperative bank cannot on its own handle. At the European level, such grants and subsidies are, however, a key pillar of the agribusiness. Here, again, the cooperative central bank acts as the "clearing house" that provides the technical and processual basis for the successful loans approval by the Cooperative bank in question. The general role of the financial adviser is discussed by Bröger and Boll (2003).

In other words, only by collaborating with the cooperative financial system can the individual Cooperative banks tap growth opportunities that are then to the benefit of their members. And do so with regard to a high-earning and low-risk client group.

3.4 Relevance for the cooperative banking sector

This interaction between the individual Cooperative banks and the cooperative central bank is strongly reflected in the loans volume that the German banking sector has invested in the field of "energy". The field includes not only investments in wind energy but also loans approved for the mining, hydropower and biogas segments. However, as these only constitute a marginal share of total loan approvals and within the cooperative sector account for as good as "zero" loans. Such investments can definitely be considered representative of those in wind parks. Indeed, if there have been loans approved for mining and hydropower companies of late, then such credits tend to have gone through the large banks given the volumes involved, meaning that the share in question should reveal even more pronouncedly negative growth rates.

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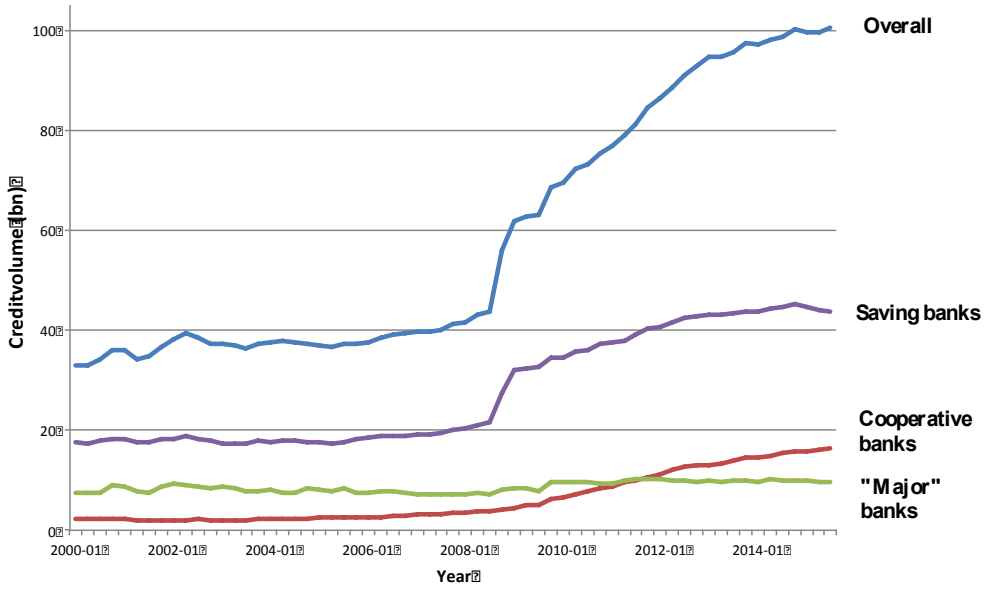
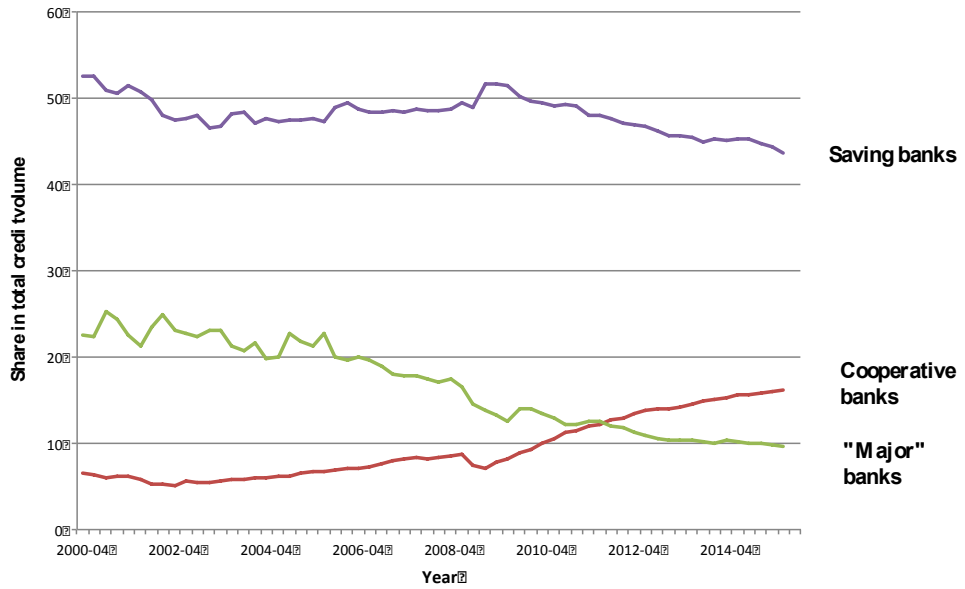
Figure 8: Credit volume (nominal) in Germany`s wind power sector



Source Data from: Macroeconomic Database (Bundesbank, 2016)

Figure 9: Credit volume (pro rata) in Germany`s wind power sector



Source Data from: Macroeconomic Database (Bundesbank, 2016)

These charts reveal that since 2000 the cooperative financial system's investment volume in the field of (wind) energy has as good as trebled. While that of large banks has fallen by half. Moreover, the period of the financial crisis (from 2007 onwards) shows an interesting trend. Investment patterns by both banking segments point south. However, loan approvals by the cooperative financial system recovers, while investments by major banks continues to head downwards. This can be considered an example of the fact that the cooperative financial sector was less hard-hit by the financial crisis and was swiftly back investing in growth

markets. In the wake of the financial crisis, the large banks have not succeeded in regaining their hold on this sector.

Banks incorporated under public law have a special importance in the financial sector compared to cooperative banks. Such banks are structured similar to the Cooperative banks, meaning they are a banking group consisting of a very many small decentrally structured primary banks that are likewise supported by public central banks. Such banks have from the outset held an extremely high share of the market but in the period in question have seen business stagnate or dwindle slightly. While the high initial level of investments can be attributed to increased interest by the public sector and thus financing by "its" banks, the trend points to there now being greater competition in this sector from the cooperative banks.

4. Conclusion

While the in part exceptionally high growth rates in the field of renewable energy and in particular for wind parks have been highlighted in many discussions and cooperatives as a corporate form have of late started to experience a renaissance, cooperative banks financing a growth sector is a topic that has hitherto largely gone unheeded – although as we have seen above there is considerable growth potential. While of late there have been no discernible major shifts in purely nominal growth among cooperative banks, the growth rates for financing wind energy systems by cooperative banks are a first indication of a shift in market shares in a steadily growing market.

This is where in particular four of the above-mentioned core competences of a rurally-structured and decentrally organized cooperative bank come into their own. Regional market entry is characterized by:

- A focused Cooperative bank key account strategy for agribusiness clients
- Focused networking with agribusiness clients by the Cooperative bank
- A product policy for individual inquiries from agribusiness clients (supported by a central bank)
- A market analysis and expert know-how provided by the central bank in question

This success bears emphasizing specifically against the backdrop that at the turn of the millennium many discussions hinged on predicting that the cooperative banks did not have a rosy future. In particular, their agricultural focus and decentral structures seemed to pose a problem for the future in an age of digitalization and a shift into the service society, when bank services ceased to focus on close links to clients. Likewise, many Cooperative banks seemed to small to survive. However, with the rethink in energy policy at the European level a new, very lucrative field emerged precisely for these banks. Moreover, thanks to their sound business model, one that had in part been questioned for being overly conservative, precisely the small Cooperative banks came out the winners in the financial crisis. Their business policy and their financing services as supported by a cooperative central bank not only enabled them to emerge unscathed from the financial crisis but also ensured they were able to attract market share in business fields away from other institutional groups following the crisis. This was described above taking the example of wind energy.

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Farmers' economic viability assessment in the context of taxation and support

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Abstract
The paper analyses the economic viability of farms and how much this indicator is influenced by main external factors - support and taxes. Assessment of economic viability of farms has suggested that in Lithuania, support is the main external factor of continued viability of small- and mid-sized farms, while the unequal distribution of the tax burden reduces economic viability of farms and they become non-viable. The problem put forward in the research is what taxation system would create conditions for the farmers' farms to remain viable, irrespective of the support. Alternatives on improvement of farmer taxation system are proposed. The paper presents the practice of farmer taxation in other countries and analysis of scientific literature on the subject, on the basis of which the model for improvement of farmer's profit taxation, as well as social and healthcare insurance contribution is put forward. This model would ensure more equal distribution of tax burden between the farms of different sizes, which would allow the farms to remain viable irrespective of the scopes of the received support.

Keywords: *Economic viability of farms, taxes, subsidies*

JEL Classification: *Q12, H25, Q18*

1. Introduction

Agricultural activity has gradually been becoming a profitable business and has been subject to progressive inclusion of farms into the general taxation system of the country. As a result of such inclusion, possibilities for farms to maintain viability have been changing. In light of such changes, the effect of taxation on viability of farms must be assessed in order to develop a coherent and effective state taxation system supported by legislation and scientific research that would promote growth of national economy and ensure social justice for all stakeholders of the economy, including conditions for continued viability of farms.

Researchers across the globe have engaged in comprehensive analysis of economic viability of farms (Adelaja and Sullivan, 1998; Popelier, 2005; Singh, Bhillar, Joshi,2009;Argiles, 2001; Lappin, Fitz, Simons, 1982; Scott, 2005; Huck, 2007; Whitaker, 2009; Boullet, George, Otmani, Hartmann et al, 2012). Nonetheless, the studies usually tend to focus on the effect of direct support that promotes greater viability, but fail to consider the extent to which economic viability of farms is reduced by the national taxation systems. As a result, assessment of viability of farms within the context of taxation has remained a relevant research object.

Research problem: what taxation system would provide conditions for continued viability of farmers' farms, irrespective of the support granted? Research aim: to assess the effect of taxation system on economic viability of farms. The following objectives have been set out to reach the research aim: 1) to define the concept of economic viability and assessment indicators; 2) to identify the main issues in taxation of the farmers' farms;3) to put forward proposals on the most appropriate taxation system in view of the possibilities for farms to maintain economic viability, on the basis of analysis of taxation practice in relation to the farmers' farms.

Research methodology. Comparative and systematic analysis of research works by other researchers, literature on economics, and analytical works has been performed in order to determine and assess the research problem. The methods of data grouping, metallization and classification; horizontal, vertical, relative indicators (ratio) analysis, graphic data representation,

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logical abstraction, and statistical analysis have been used in the research. The research is based on generalisation of taxation practice in relation to farmers' farms in the EU as well as accountancy data of the farmers' farms included in the FADN data network. Data of the Lithuanian respondent farms included into the FADN 97 have been used in the study. Inclusion of farms into the FADN is based on two key indicators: economic size of a farm that defines its yield potential, and the type of farm that defines its specialization; the farms are grouped by economic size (ES) by random sampling. In order to summarize the research findings and provide clearer definition of the pattern of economic viability of farms, the farms have been grouped into four groups by ES: very small farms (standard output (SO) from 4 000 to 8 000 €), small-sized farms (SO: 8 000 – <25 000 €), mid-sized farms (SO: 25 000 – <100 000 €), and large-sized farms (SO: 100 000 € and more).

2. Methodology for assessment of economic viability of farmers' farms

Economic viability of a farm IS its capability of survival, continued operation, and development using the available resources. According to researchers, viability is largely determined by two external factors: subsidies that help maintain economic viability of farms and taxes that are the major negative factor of economic viability of farms.

Analysis of the literature has suggested that a wide range of indicators characterising farm's viability are used, although not all of them being significant. In this study, economic viability is assessed by four indicators (Table 1) determined as the most significant for determination of economic viability of a farm in the empirical study by Savickienė and Slavickienė (2012a).

Table 1: Key indicators of economic viability of a farm

Indicators	Factor analysis models	Factor description	Viability Threshold
Return on investment	((TO + SEI) – VUL) / ((CA + FA) – (STD + LTD))	TO – total output SEI – subsidies excl. investment VUL – value of unpaid labour (farmer and family members) CA – current assets FA – fixed assets STD – short-term debt LTD – long-term debt	More than 5 %
Expense to income ratio	(INTCON + DEP+ EXF) / (TO + SEI)	INTCON – intermediate consumption DEP – depreciation EXF – external factors TO – total output SEI – subsidies excl. investment	Less than 80 %
Debt to net income ratio	(STD + LTD) / ((TO + SEI) – (INTCON + DEP + EXF))	STD – short-term debt LTD – long-term debt TO – total output SEI – subsidies excl. investment INTCON – intermediate consumption DEP – depreciation EXF – external factors	Less than 600 %
Direct payments to producers and dependency ratio	SEI / ((TO + SEI) – (INTCON + DEP + EXF))	SEI – subsidies excl. investment TO – total output INTCON – intermediate consumption DEP – depreciation EXF – external factors	Less than 20 %

Source: Scott (2001), Savickienė, Slavickienė (2012a)

The aforementioned indicators are calculated under two modes, i.e. adjusted for the support or not adjusted for the support. After main taxation issues are identified and good practice of farm taxation in the EU is summarized, alternative options will be developed for simulation of economic viability of farms and choice of the most appropriate farm taxation system.

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3. Scientific rationale behind improvement of taxation systems for farmers' farms

Improvement of taxation systems for farmers' farms is relevant for scientific research. This subject has been little studied in Lithuania. Analysis of the recent research literature published in the period of inclusion of farmers into the common national taxation system in Lithuania (since 2009) has suggested that only a few researchers (Grakauskas, Marcijonas, 2005; Juškevičienė, Lakis, 2010; Slavickienė, Savickienė, 2012a; Juškevičienė, 2012; Miceikienė, Novošinskienė, Savickienė, 2014) have analysed the taxes paid by farmers and the relating issues.

Farmer taxation has not been analysed comprehensively, i.e. by looking at individual taxes, although taxes are referred to as one of the causes for reduction of economic viability of farms in the literature (Slavickienė, Savickienė, 2012b; Miceikienė, Novošinskienė, Savickienė, 2014).

Researchers in other countries have shown deeper inquiry into this subject. Analysis of scientific publications has suggested that several scientific approaches towards the issue exist: 1) researchers who claim that farmer taxation should be dissociated from the general national taxation policy, farmers should be provided with preferential taxation conditions due to unique nature of their activity, while privileges are referred to as support to agriculture (Rajaraman, 2004; Cahill, 2006; Hill, Blandford, 2007; Parlińska, 2008; Slavickienė, Savickienė, 2012a); 2) researchers who claim that privileges related to farmer taxation do not comply with the principle of fair taxation and should either not be applied or apply to everyone (Zhong et al., 2011); 3) the effect of tax reform on development of agriculture (Johanessen, 1993; Juškevičienė, Lakis, 2010), 4) smaller enterprises, farms should not be subjected to the same taxation rules and principles as the ones that apply to large-sized business entities (Casamatta, G.; Rausser, G.; Simon, L., 2011); 5) lower income tax as one of the possible measures for reduction of inequality in farm income (Zel, 1995; Fuest et al, 2008); 6) the effect of the tax rate, tax burden, tax base on economic viability of a farm (Grakauskas, Marcijonas, 2005; Juškevičienė, Lakis, 2010; Slavickienė, Savickienė, 2012b).

According to Hill and Blandford (2007), high tax rate applied to farmers' farms may be compensated by many exceptions in one country. On the other hand, another country may apply low tax rates without any privileges. Thus, although tax treatment of farmers' farms may seem similar in different countries, privileges must be considered in order to compare the countries, irrespective of whether tax rates are high or low.

Authors of this paper support the approach that farmer taxation should be dissociated from the general national taxation system. Farming is imminently dependent on ambient conditions (Adelaja, Sullivan,1998;Adelaja, et al, 2007). Viability depends on climate conditions, use of natural resources. If the farmer's soil is fertile, his/her income will be higher than the income earned by farmers who operate on a soil of low-scored fertility. Economic viability of farms also depends on social-demographic changes. Huck (2007) has emphasized that economic viability of farms depends on economic fluctuations (viability is lower during the periods of crisis).

Having analysed the issues listed by other researchers, authors of this paper have identified the following main issues in taxation of farmers' farms: 1) unequal taxation treatment of farmers has been identified in Lithuania, as the farmers are grouped into 4 groups that are subject to different state social insurance and healthcare insurance contribution rates and different tax base. This system does not correlate with income earned by farms, and reduces economic viability of small- and mid-sized farms disproportionately; 2) income tax applying to farmers' farms does not satisfy the principle of fair taxation due to limited application of non-taxable amount of income, as the exemption does not apply to farmers' income; 3) farmers are not allowed to reduce the taxable income by the incurred life insurance, retirement savings, study expenses, which means that taxation of farmers' income does not comply with the principle of fair taxation; 4) differentiation of farms by grouping them into 4 groups by economic size and VAT payer's status for taxation purposes increases complexity of the taxation system, does not satisfy the principles of taxation,

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leads to regressive nature of the system, increases tax burden on small- and mid-sized farms, and reduces tax burden on large-sized farms.

The identified farmers' farm taxation issues have suggested that high tax burden leads to reduction of economic viability of small- and mid-sized farms exactly due to these issues. Hence, taxation system must be improved in order to enhance economic viability of farmers' farms in Lithuania.

4. Analysis of farmers' farm taxation practice in the EU countries

Taxation systems of the EU member countries are based on a number of complex social and economic factors, such as taxpayers' culture, cost of living, consumption habits, attitude towards the role of state in economics, and the level of awareness of society about the importance of taxes.

Comparison of different taxation systems may be very practical for the research. Many studies have demonstrated high level of similarity between taxation systems of the EU countries, irrespective of differing social-economic and political factors. Analysis of taxation systems of the EU countries has shown that some of the analysed countries apply a separate taxation system for agriculture, why others do not have such a distinction. Nonetheless, farmers' farms, as taxpayers, are treated differently compared to other professionals, and the agricultural sector receives special taxation treatment. Analysis of farmers' farm taxation in the EU countries has essentially shown the following main concepts: 1) application of general taxation system: agriculture is subject to same taxation principles, legal base as other groups of profession: taxation system does not offer any instruments (privileges) to support agriculture (Finland); taxation system offers a number of different preferential instruments, such as investment reliefs and other exemptions (the Netherlands, Spain, Belgium, the United Kingdom, Ireland, Denmark, Sweden, Slovakia); 2)special (preferential) taxation system: separate legislation on taxation, regulations applying to farmers, aimed at reducing the tax burden (Austria, Germany, France, Italy, Poland) (Soliwoda, J.Pawlowska-Tyszko, 2014).

Taxation of profit (taxable income) is one of the main components of a taxation system. EU countries may be grouped into two groups by taxation of profit (taxable income): 1) countries exercising relatively low tax rate on farmers' taxable income: the Czech Republic, France, Greece, the Netherlands, Poland, and Spain; 2) countries exercising high tax rate on farmers' income: Belgium, Denmark, Finland, England, Ireland. The situation reflects the classification based on the "southern" and "northern" tax mentalities (Krajewska, 2010).

Authors of this paper suggest attributing Lithuania to the group of low tax rate that applies to agricultural income. All Lithuanian farmers, VAT payers, receiving income are subject to personal income tax rated at 5 %, while non-VAT payers are exempt from this tax. This suggests that general taxation system is applied to agriculture in Lithuania, with certain privileges, however.

Ireland, the United Kingdom apply certain privileges and investment promotion measures in taxation for farmers' farms, and these measures are instruments of the general taxation system. Same situation has been observed in the Netherlands, Denmark, Spain, and other countries. Finland is considered as most unfavourable in terms of farmer taxation in the EU, and does not apply any special privileges to farmers. Austria, Germany, France, Italy have chosen a different taxation system and apply special preferential taxation systems for farmers (Guide to Farming Taxation, 2014).

Special taxation treatment in relation to profit (taxable income) in agriculture should be based on various criteria, while tax base is the most popular criterion (Casamatta, G. et al, 2011; Grosu, V, Socoliuc, M., 2008). Two concepts are used both in theory and in practice of tax base estimation:

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causal and effect-based. The first concept suggests that, when major taxation factors of n farm viability are calculated, land and buildings must be accounted for in order to calculate the accumulated tax. The second notion implies the basis for income, production, or income results excluding their sources. It should be noted that due to different methods applied by various member countries of the European Union to calculation of farm income, the map of taxation system is rather colourful.

In general, it may be claimed that EU member countries could be grouped into three groups by the farmers' farm taxation systems: 1) countries applying special preferential taxation systems to agriculture; 2) countries applying limited privileges to agriculture; 3)countries applying taxation system without any taxation preferences to agriculture.

Main taxes paid by farmers' farms in all the analysed countries are wealth tax, personal income/profit tax, mandatory healthcare insurance contributions, state social insurance contributions. These taxes may have essential effect on viability of farmers and agricultural enterprises, and the study further analyses the taxes paid by farmers in the EU countries that have been sampled for the study.

The analysis has suggested that the taxable base in other countries is largely formed of *taxable income*, while the tax rates are considerably higher compared to those in Lithuania. Progressive taxation of income has been observed in many analysed countries.

In Lithuania, social and healthcare insurance contributions paid by farmers depend on the farm size and farm status with reference to VAT. Social and healthcare insurance paid by farmers in other European countries is characterised by various trade-offs that depend on farm size, income or yield.

Eirošius et al (2012) have analysed social insurance paid by Lithuanian farmers and identified that the main issue, in this case, is the twofold tax burden: if the farmer's income falls within the range between minimum wage and average insured income, fixed tax burden applies, but the burden tends to reduce due to contribution ceiling (where actual income is higher than the insured income), as a farmer pays the fixed contribution only, irrespective of the income. The size of retirement pension also becomes fixed, irrespective of the income earned.

Thus, tax burden is fixed despite growth of a farmer's income, and starts reducing as soon as certain threshold is reached. This leads to reduction of economic viability of very small, small- and mid-sized farms, irrespective of the income earned by the farmer, i.e. of whether or not he/she is capable of paying social insurance contributions.

The scope of farmers' social insurance in other European countries is reviewed further. Pervious researches suggests that the scope of social and healthcare insurance provided to farmers in the European countries is wider than in Lithuania, while the contributions depend not only the farm size (which is the only factor in Lithuania), but also on land fertility, value of land ownership, earned income, farmer's age, etc.

Based on the research and practice in other countries, the following alternatives for taxation of farmers' farms in Lithuania have been developed (these alternatives are applicable to other countries for improvement of their taxation systems as well).

For taxation of farmers' profit: 1) fixed non-taxable income, with 5 % personal income tax applied in case the fixed threshold is exceeded; 2) farmer taxation similar to taxation of other registered self-employment activity (5 % tax rate applied to profit earned); 3) progressive taxation of personal income earned from agricultural activity (0 to 15 %).

For farmers' taxation by state social and healthcare insurance contributions: 1) Social and healthcare insurance contributions paid by farms related to the minimum wage, i.e. contributions to be paid, if the income exceeds the minimum monthly wage (MMW), or starting with the month, when minimum income for the calendar year has reached the minimum amount

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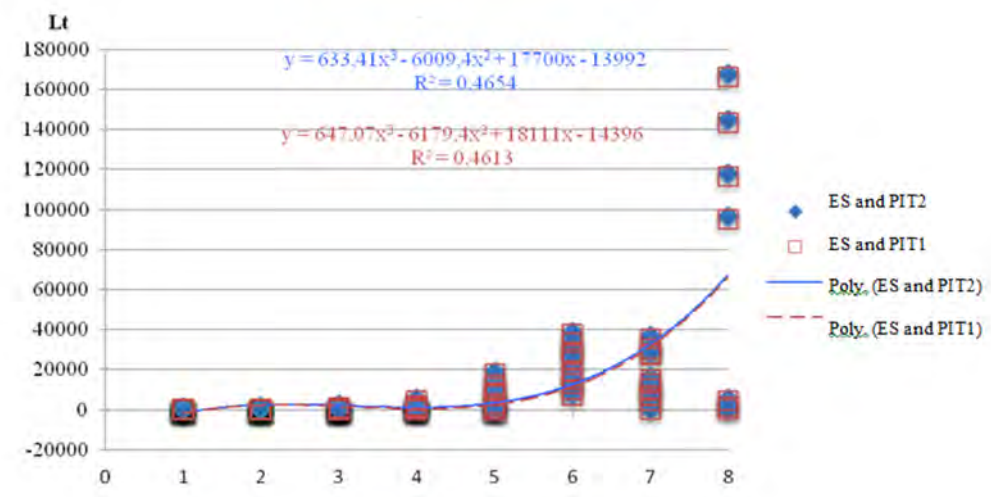
(MMW×12). Contributions are paid based on the taxable income; 2) Social and healthcare insurance contributions paid by farmers similar to contributions paid by persons engaged in other registered self-employment activity (50 % of profit is subject to 28.5 % of social insurance contributions and 9 % of mandatory healthcare insurance contributions), i.e. no ES-based distinction between farmers' farms for the purpose of contribution payment.

Simulation and assessment of alternatives of the personal income tax, social insurance, and healthcare insurance have been implemented based on the developed model for improvement of farmers' farm taxation system aimed at supporting and improving economic viability of farms.

In case of the Alternative 1 under the model for improvement of farmers' farm taxation system, the example of Ireland is applicable, where non-taxable amount of income applies to income earned at a farmer's farm, i.e. annual income from agricultural activity exceeding 24 MMW (7200 EUR) is subject to taxation. Taxable income earned at 97 farms in 2013 has been chosen for the analysis. 0 % tax rate applies to income received at a farmer's farm from agricultural activity that does not exceed 24 MMW; if the income is exceeded, 5 % tax rate applies. Alternative 2 represents an actual situation, where income earned at the Lithuanian farmers' farms from agricultural activity is subject to 5 % tax rate without any non-taxable amount of income.

Figure 1: Payable personal income tax according to the model for improvement of the farmers' farm taxation system



Source: developed by the authors

In general, Fig. 1 suggests that Alternative 1 may be appropriate for solution of one of the issues identified in the study, namely, non-compliance of the personal income tax with the principle of fair taxation caused by absence of any non-taxable amount of income for the income earned at farmers' farms from agricultural activity. Empirical studies has demonstrated that, with the non-taxable amount of income (24 MMW) applied, the paid amount of the personal income tax would always be lower, and 14 farms of all the analysed sample would be exempt from the personal income tax, although they did pay it in 2013. 7 of the 14 farms, which would be exempt from personal income tax due to non-taxable amount of income, belong to the group of very small and small-sized farms, meaning that this measure would improve economic viability of such farms as well.

In case of Alternative 2, the situation, where income earned at the Lithuanian farmers' farms from agricultural activity is subject to 5 % tax rate without any non-taxable amount of income.

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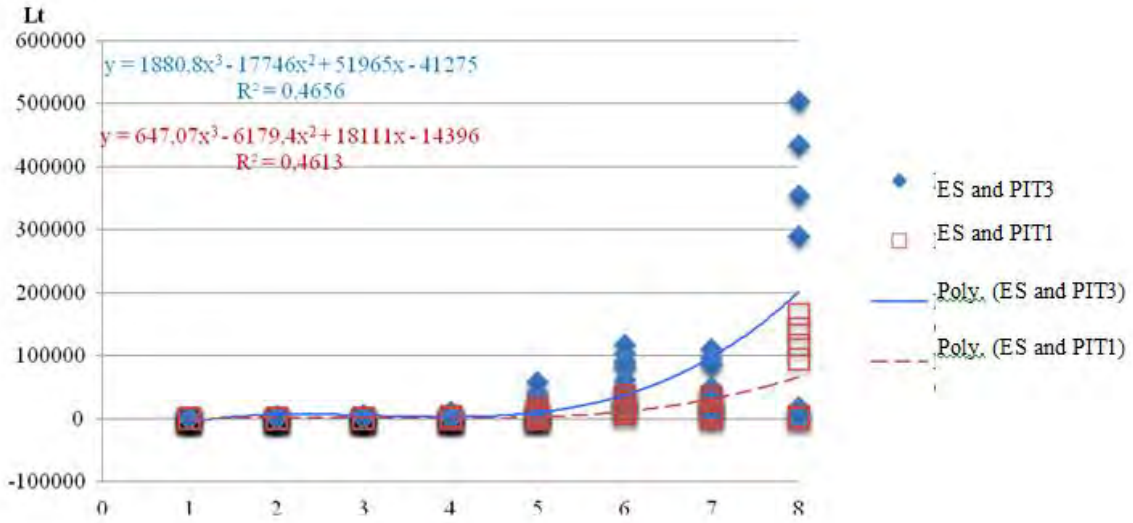
Figure 2: Payable personal income tax in cases 2 in 2013 according to the model for improvement of the farmers' farm taxation system



Source: developed by the authors

Pursuant to the study findings (Fig. 2) and by differentiation of farm income from sale as well as application of the respective tax rates, the amount of personal income tax payable by all the analysed large-sized farms or farms with ES > 100 would be twice as high as the amount paid in 2013. As a result, tax burden on such farms is higher. On the other hand, this principle would help solve the issue identified in the second part of the work, namely, the complexity of taxation system caused by differentiation of farms into 4 groups by farm's economic size and VAT payer's status. This would reduce tax burden on very small, small- and mid-sized farms that maintain their viability by receiving subsidies, and increase tax burden on the large-sized farms that are viable both with and without subsidies. Progressive taxation of income from agricultural activity would comply with the principle of fair taxation, as taxpayers of the same economic capacity would be subject to same taxation.

For solution of the identified issue, namely, that mandatory social and healthcare insurance contributions paid by farmers do not comply with the principle of fair taxation due to unequal proportion of the income paid to the state, the authors of this study have put forward two alternatives in their model for improvement of farmers' farm taxation that they have applied to the analysed farms and assessed.

Calculations in case 1 have shown that amounts of contributions would increase significantly for the farmers' farms that exceed the annual 12 MMW threshold of the taxable income from agricultural activity, in case the first model is applied. It is therefore important to determine the effect of such situation on economic viability of these farms, which would also help determine the applicability of the applied model.

The study further assesses the model of case 2 that refers to improvement of social and healthcare insurance contributions paid by farmers. Under this model, farmers' farms would receive equal contribution-related treatment as other registered self-employment activities, which means that farmers' farms are not grouped by ES for the purpose of contribution payment. This model is more applicable to Lithuanian farmers' farms, as it complies with the principle of fair taxation. In case state social insurance and mandatory healthcare insurance contributions paid by farmers' farms are the same as those paid by persons engaged in other registered self-employment activity, the contribution payment system would be clearer and simpler, and would reduce tax burden on farms with smaller income. However, it is important to analyse the effect of such system on economic viability of farmers' farms.

In order to assess the applicability of the proposed alternative for improvement of farmers' farm taxation aimed at maintaining and improving economic viability of farms, the authors of this paper have recalculated 3 viability indicators (expense to income ratio, debt to income ratio, direct payments to producers and dependency ratio) in 2013 for all the analysed farmers' farms. The indicators at analysed farmers' farms were recalculated taking into account the change of external factors at each farm in case of each individual model.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013, research results have showed that, if Alternative 1 and Alternative 2 of the model had been applied to farmers' farms in 2013 in order to improve taxation system in relation to social and healthcare insurance contributions paid by Lithuanian farmers' farms, 100 % of farms would have maintained viability regardless of the group. According to calculations of the same indicator at the analysed farms for the year 2013, almost 99 % of the farms have been determined as viable; however, if not adjusted for subsidies received by a farm, only 78 % of farmers' farms would be determined as viable. On the other hand, only 84 % of farmers' farms would maintain viability according to the estimated expense to income ratio adjusted for subsidies attributed to income at the analysed farmers' farms under Alternative 1 and Alternative 2. The share of viable small-sized farms and mid-sized farms would increase by, respectively, 33 % and 56 %, while all large-sized farms (100 %) would remain viable, same as earlier. Thus, if Alternative 1 and Alternative 2 aimed at improvement of social and healthcare insurance contributions are applied, economic viability of small- and mid-sized farms increases according to the viability indicator adjusted for subsidies.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 600%, 2013, research results have showed that according to another viability indicator , i.e. debt to income ratio, at the analysed Lithuanian farmers' farms, 98 % of the farms would be viable under Alternative 1, and 97 % – under Alternative 2 of the model. The estimated indicator has suggested that 97 % of the analysed farms were viable in 2013, and only 87 % according to the same indicator not adjusted for subsidies. Thus, Alternative 1 of the model would lead to increase of the viable farms by 1 farm; while according to the indicator not adjusted for subsidies, the number of viable farms would grow under Alternatives 1 and 2. More detailed analysis of data has suggested that the share of very small viable farms would be maintained, while the share of mid-sized viable farms would increase by as many as 56 % in case of both Alternative 1 and Alternative 2. Economic viability of mid- and large-sized farms would be maintained, i.e. almost 100 % of these farms are viable under the both Alternatives, both adjusted and not adjusted for subsidies.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 20%, 2013, research results have showed that direct payments to producers and dependency ratio calculated under Alternative 1 and Alternative 2 of the model at the analysed farmers' farms has shown minor change in the number of viable farms. The number of viable farms has remained the same under Alternative 1 for improvement of contributions, compared to the number of viable farms in 2013.

The two calculated viability indicators not adjusted for subsidies (expense and income ratio, date and income ratio) calculated at the analysed farm under each individual alternative have suggested that the alternatives would allow maintain and increase economic viability of small- and mid-sized farms. The number of viable farms would increase by 8 % in total, according to expense and income ratio not adjusted for subsidies both under Alternative 1 and Alternative 2. The number of viable farms according to the debt and income ratio not adjusted for subsidies would increase by as many as 12 %.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013, research results have suggested that, if case 1 and case 2 of the model had been applied to

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farmers' farms in 2013 in order to improve taxation system in relation to social and healthcare insurance contributions paid by Lithuanian farmers' farms, 100 % of farms would have maintained viability, irrespective of the group. According to calculations of the same indicator at the analysed farms for the year 2013, almost 99 % of the farms have been determined as viable; however, if not adjusted for subsidies received by a farm, only 78 % of farmers' farms would be determined as viable.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 600 %, 2013, according to another viability indicator, i.e. debt to income ratio, at the analysed Lithuanian farmers' farms, 97.94 % of the farms would be viable in case 1 of the model, and 96.91 % in case 2 of the model. The estimated indicator has suggested that 96.91 % of the analysed farms were viable in 2013, and just 86.6 % according to the same indicator not adjusted for subsidies. Thus, case 1 of the model would lead to increase in the share of viable farms by almost 2 % points.

Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 20 %, 2013, direct payments to producers and dependency ratio calculated under case 1 and case 2 of the model at the analysed farmers' farms has shown minor change in the number of viable farms. Both in 2013, both in case 1 of the model, just 23.71 % of the farms have remained viable. On the other hand, the number of viable farms would increase by 2 % points in case 2 of the model.

Assessment of the designed model for improvement of farmers' farm taxation has suggested that Alternative 1 on improvement of the personal income tax and Alternative 2 on improvement of the state social insurance and mandatory healthcare insurance contributions are the most appropriate in order to maintain and improve economic viability of farmers' farms.

5. Conclusions

1. Analysis of scientific approaches towards the specifics of farmers' farm taxation has been conducted, and the following issues have been identified:

- farmers' farms are not capable of reducing the taxable income by the non-taxable amount of income, incurred life insurance, retirement savings, study expenses, which suggests that the personal income tax does not comply with the principle of fair taxation;
- unequal taxation treatment of farmers' farms caused by grouping them into 4 groups that are subject to different state social insurance and healthcare insurance contribution rates and different tax base;
- differentiation of farmers' farms by grouping them into 4 groups by economic size and VAT payer's status for taxation purposes increases complexity of the taxation system, does not satisfy the principles of taxation, leads to regressive nature of the system, increases tax burden on small- and mid-sized farms, and reduces tax burden on large-sized farms.

2. Model for improvement of farm taxation system comprised of three alternatives on improvement of the personal income tax and two alternatives on improvement of the state social insurance and mandatory healthcare insurance contributions. Actions performed in case of each alternative have also been indicated. The model is based on the practice in other countries and analysis of scientific approaches towards the subject.

3. Assessment of applicability of the model for improvement of farmers' farm taxation system in order to maintain and improve economic viability of farms has provided the following results:

- application of alternative 1, where non-taxable amount of income applies to income earned at a farmer's farm, and 2, where income earned at the Lithuanian farmers' farms from agricultural activity is subject to 5 % tax rate without any non-taxable amount of income, had showed that in alternative 1 case small and small-sized farms would improve economic viability and in case 2 tax burden will increase on the large-sized farms and will be reduced on

very small, small- and mid-sized farms. These farms will maintain their viability by receiving subsidies.

- Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013, research results have showed thatif Alternative 1 and Alternative 2 aimed at improvement of social and healthcare insurance contributions are applied, economic viability of small- and mid-sized farms increases according to the viability indicator adjusted for subsidies. Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 600%, 2013, research results have showed thatEconomic viability of mid- and large-sized farms would be maintained, i.e. almost 100 % of these farms are viable under the both Alternatives, both adjusted and not adjusted for subsidies. Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 20%, 2013, research results have showed that direct payments to producers and dependency ratio calculated under Alternative 1 and Alternative 2 of the model at the analysed farmers' farms has shown minor change in the number of viable farms.

- Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 80 %, 2013, research results have suggested that, if case 1 and case 2 of the model had been applied to farmers' farms in 2013 in order to improve taxation system in relation to social and healthcare insurance contributions paid by Lithuanian farmers' farms, 100 % of farms would have maintained viability, irrespective of the group. Analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 600 %, 2013, research results have showed that in case 1 of the model would lead to increase in the share of viable farms by almost 2 % points. Meanwhile analysing Lithuanian farmers' farms by farm ES with expense to income ratio < 20 %, 2013, research results has showed that the number of viable farms would increase by 2 % points in case 2 of the model.

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Financial system and agricultural growth in Ukraine

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Abstract
We build the simplified models of integral indicator of level of financial system development and agricultural growth using the principles of concept of "moderate middle way". We use the simplified models of integral indicator to compare the level of financial system development, economic and agricultural growth and to explore the trend of financial development and agricultural growth in Ukraine. We use the integral indicators and econometric methodologies to assess the relationship between financial development and agricultural growth in Ukraine. The results of the study revealed the absence of statistical relationship between integral indicators of financial system development and agricultural growth in Ukraine. We can ascertain the presence arguments for the existence of the impact the banking component of the financial system on the agriculture in Ukraine. The regression models showed significant directly proportional relationship between certain aspects of agriculture and resources and effectiveness of the banking sector.

Keywords: *agricultural growth, the integral indicator of the agricultural growth, the integral indicator of the financial system development, financial system*

JEL Classification: *G14, G21, Q13*

1. Introduction

The link between financial development and economic growth was been explored by scholars seriously only last 20 years. The first attempt to define the relationship between financial development and economic growth was made by Goldsmith in 1969. Using cross-country data Goldsmith found evidence of a positive trend of the ratio of financial institutions' assets to GDP for 35 countries over 1860-1963 (Goldsmith, 1969). Later many authors have extended this line of inquiry and have confirmed Goldsmith's findings. They have provided additional information on the finance-growth nexus and have offered a much bolder assessment: firm-level, industry-level, and cross-country studies. Latter offer that the level of financial development exerts a positive effect on economic growth (Beck et al., 2000; Levine et al., 1998; Levine, 2002; Rajan, 2003).

The existing literature on the finance-growth nexus uses three approaches: cross sectional analysis, a time-series approach, panel data methods (a combination of both techniques). Each of these approaches has made useful contributions to the investigation of the relationship between finance and growth. However, how Schmidt emphasized in his work (Schmidt et al, 2006) that all approaches suffer from some important limitations which do not allow us to take all results at face value. The general problem of all empirical studies is that, to examine the relationship between financial development and growth, one has to define appropriate measures of financial development. Researchers come up with various definitions and measures. Some studies use the size of the banking sector typically measured by the deposit liabilities to GDP or bank claims on the private sector to GDP, others use the size of the stock markets, defined as market capitalization to GDP or total value of domestic equities traded on the stock exchanges to GDP. However, these measures have been criticized by others (Schmidt et al, 2006).

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In our opinion, the best option solving methodological problems of evaluation of finance-growth nexus is compliance the concept of "moderate middle way", which provides[1]:

- using publicly available statistical data – quantitative objective indicators calculated using generally accepted methods and openly published on the Internet;
- maximum avoidance of subjective assessments and indicators that are characterized by uncertainty regarding the methods of collection or calculation;
- using the mathematical approaches of the average level of complexity and using average dimension data sets. However, data sets must be sufficient to identify the main statistical regularities on base of regression analysis;
- visualization of assessment results.

In this paper, we build the simplified models of integral indicator of level of financial system development and agricultural growth using the principles of concept of "moderate middle way". We use the simplified models of integral indicator to compare the level of financial system development, economic and agricultural growth and to explore the trend of financial development and agricultural growth in Ukraine. At last, we use the integral indicators and econometric methodologies to assess the relationship between financial development and agricultural growth in Ukraine.

2. Data and Methods

We suggest using the principles of concept of "moderate middle way", which is mentioned above, to build the simplified model of integral indicator of level development, which is associated with generalization of the three type's indicators: 1) scale (extensity development); 2) resources; 3) efficiency. The composition of these indicators is illustrated in the table 1.

We divide the financial system into two components – banking sector and financial markets. We propose to call the model of integral indicator of the relative level of the financial system development as «3+3» [2].

Table 1: The indicators of the simplified model of the integral indicator

The integral indicator	Components of integral indicator		
	Scale (extensity development)	**The resources**	**The efficiency**
1. Financial system development: banking sector	Commercial bank branches (per 100,000 adults)	Bank deposits to GDP (%)	Domestic credit to private sector by banks (% of GDP)
financial markets	Listed domestic companies (per 1,000,000 adults)	Market capitalization of listed companies (% of GDP)	Stocks traded, total value (% of GDP)
2. Economic growth	Employment to population ratio, 15+, total (%) (modeled ILO estimate)	Gross capital formation (% of GDP)	GDP per capita (current US$)
3. Agricultural growth	Arable land (hectares per person)	Agriculture, value added (% of GDP)	Agriculture value added per worker (constant 2005 US$)

Source: own development based on data (World Bank 2016a, 2016b).

[1] The more detail explanation of the concept of "moderate middle way" is Wasilewski at el (2015).
[2] The more detail explanation of the model "3+3" is Oliynyk at el (2015).

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We offer to consider the significance of each indicator as equal. It lets us to avoid the result distortion, which is associated with subjective judgments, regards to ranking of each indicator.

The integral indicator of level development is calculated as an area of the geometric figure (triangle is for economic and agricultural growth, hexagon – for financial system), with the tops in a coordinate system of 3 or 6 axes. Each axis corresponds to one of the indicators listed in the table 1. On each of the three or six axes, we plot the relative values, which are defined as a share of the maximum (or reference) value of the indicator.

The integral indicator of the financial system development level as an area of the hexagon can be calculated by the formula:

$$II_{FS} = \frac{1}{2} \times \left[(I_1 \times I_2) + (I_2 \times I_3) + \ldots + (I_6 \times I_1) \right] \times \sin 60^\circ , \qquad (1)$$

where II_{FS} – the integral indicator of the financial system development level;

$I_1, I_2, \ldots I_6$ – relative values of indicators used in the model "3 + 3" (6 indicators): I_1, I_2, I_3 – relative values of banking sector indicators, I_4, I_5, I_6 – relative values of the financial market indicators (see table 1).

The integral indicator of the economic growth level as an area of the triangle can be calculated by the formula:

$$II_{EG} = \frac{1}{2} \times \left[(I_1 \times I_2) + (I_2 \times I_3) + (I_3 \times I_1) \right] \times \sin 120^\circ , \qquad (2)$$

where II_{EG} – the integral indicator of the economic growth level;

I_1, I_2, I_3 – relative values of indicators of scale, resources and efficiency.

The integral indicator of the agricultural growth is calculated as well as the integral indicator of the economic growth level by the formula 2 using three indicators according to the table 1.

The integral indicator describes the relative development level and it cannot be calculated only for one country for one year without comparison with another country or establishing reference values or time-series data[3].

3. Results and Discussion

If the level of the financial system significantly affects the agricultural growth, then, obviously, we should observe a significant statistical relationship between the relevant integral indicators. Nevertheless, the conducted research has revealed that the relationships between the integral indicators of the financial system and agriculture in Ukraine for 2004-2013 are not observed (see Figure 1).

Consistent statistical patterns between integral indicators of financial system development and agricultural growth are absent, but a strong relationship between the integral indicator of financial system development and economic growth is present. In this case, we can assume that agriculture should be viewed as one of those industries, for which the complex impact of the financial system does not have significant value.

[3] The more detail explanation of the concept of "moderate middle way" is Wasilewski at el (2015).

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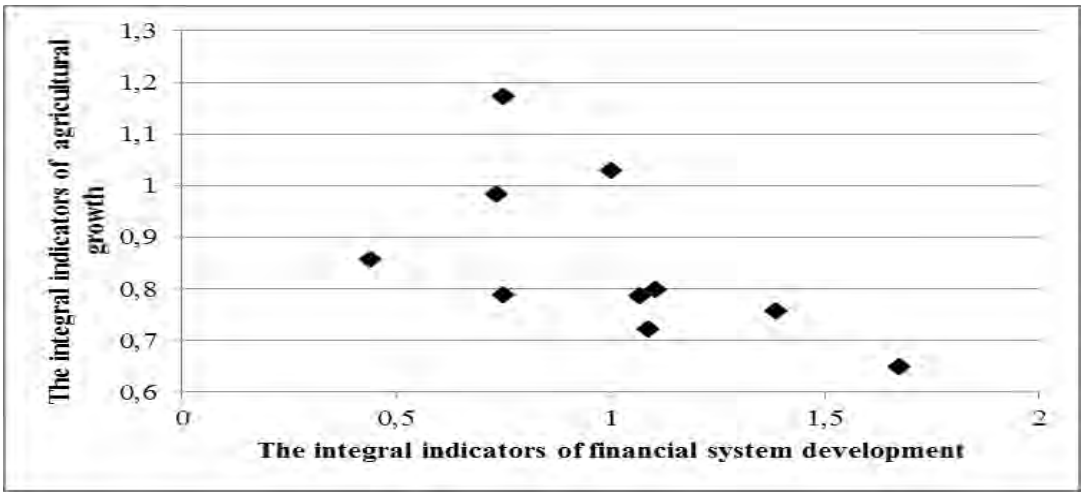
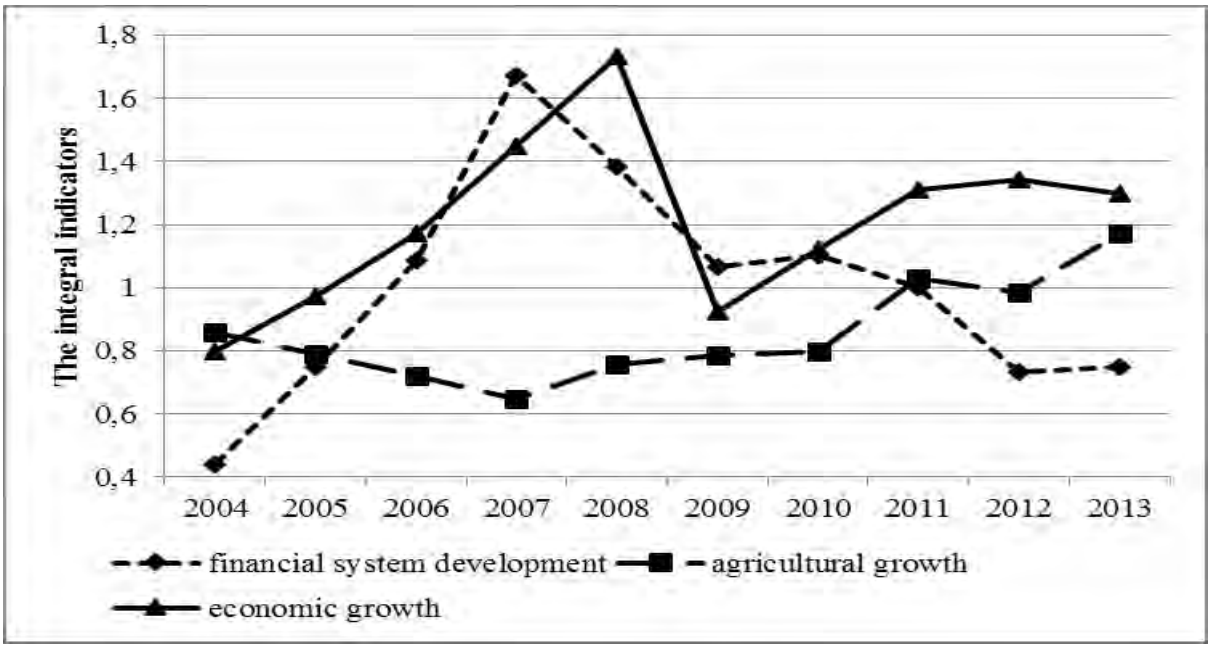
Figure 1: The interdependence between the integral indicators of financial system development and agricultural growth in Poland and Ukraine, 2004 – 2013



Source: author calculations based on data (World Bank 2016a, 2016b).

In general, the relatively stable development of the agriculture in Ukraine took place with turbulent financial system and economic development processes in the background (Figure 2).

Figure 2. The trend of integral indicators of financial system development, economic and agricultural growth in Ukraine, 2004 – 2013



Source: author calculations based on data (World Bank 2016a, 2016b).

The study reveals strong statistical relationship between integral indicator of financial system development (taken with 1 year in advance) and integral indicator of economic growth of Ukraine (Figure 3), despite the fact that any similar interdependencies with integral indicator of agricultural growth were not observed.

Absence of the complex influence of the financial system development on the agricultural growth, which was observed in Poland and Ukraine during the studied period (according on the integral indicators analysis), yet does not give any reasons to conclude that the development of financial system does not influence the development of agriculture in these

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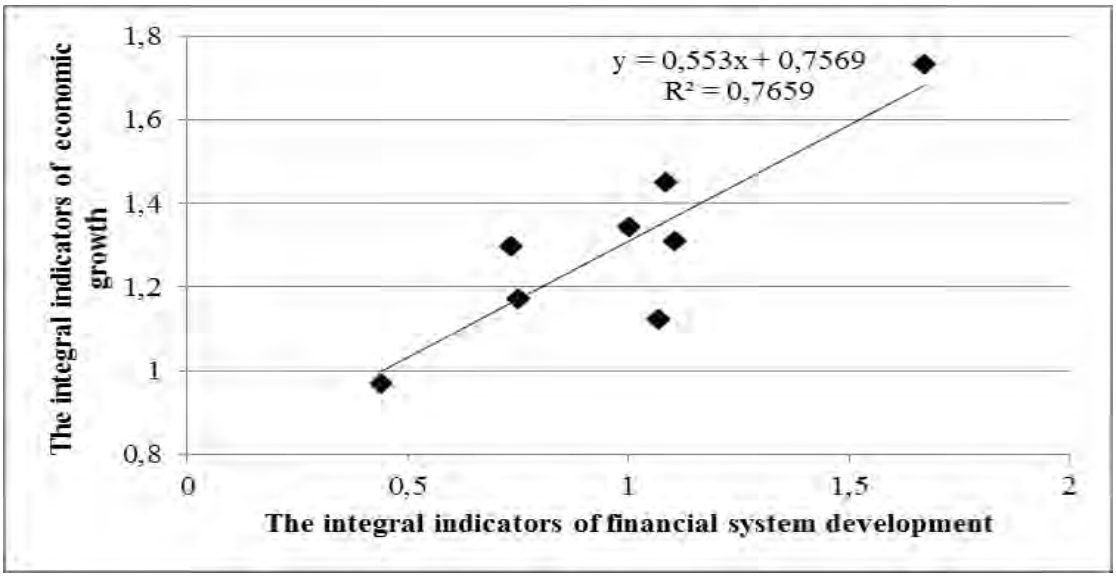
countries. Important relations may exist between indicators characterizing separate aspects of financial system and agricultural growth.

Figure 3. The regression model describing the interdependence between integral indicators of the financial system development (for the previous year) and economic growth in Ukraine (the values of integral indicators of the financial system development are for 2004-2012, data of 2008 is excluded; the values of integral indicators of the economic growth are for 2005-2013, data of 2009 is excluded).



Source: author calculations based on data (World Bank 2016b).

Taking into consideration only the development of banking component of financial system, as the most significant one (as many researchers assume) for small and medium agricultural producers, and analyzing the correlation between its integral indicator and separate indicators of agricultural growth, we can identify certain statistical dependencies (Table 2).

Table 2: Correlation coefficients between integral indicator of the banking component of financial system and separate indicators of agricultural growth in Ukraine, 2004-2013

The indicator of agricultural growth	Correlation coefficients with integral indicator of the banking component of financial system
Arable land (hectares per person)	0,450
Agriculture, value added (% of GDP)	**-0,843**
Agriculture value added per worker (constant 2005 US$)	0,212

Source: author calculations based on data (World Bank 2016a, 2016b).

Most notably, in the Table 2 we can observe: strong negative correlation between the development of the banking component of the financial system and value added in agriculture (% of GDP). Regression models (Figure 4) illustrate the identified dependencies.

In Ukraine the relationship between the development of the banking component of the financial system and value added per worker in agriculture is very weak. This fact, combined with the existence of inverse relationship between the development of the banking component of the financial system and value added in agriculture (Figure 4), can be evidence to the following: agriculture in Ukraine should be viewed as one of those industries for which the complex influence of the banking component of the financial system development is insignificant or negative.

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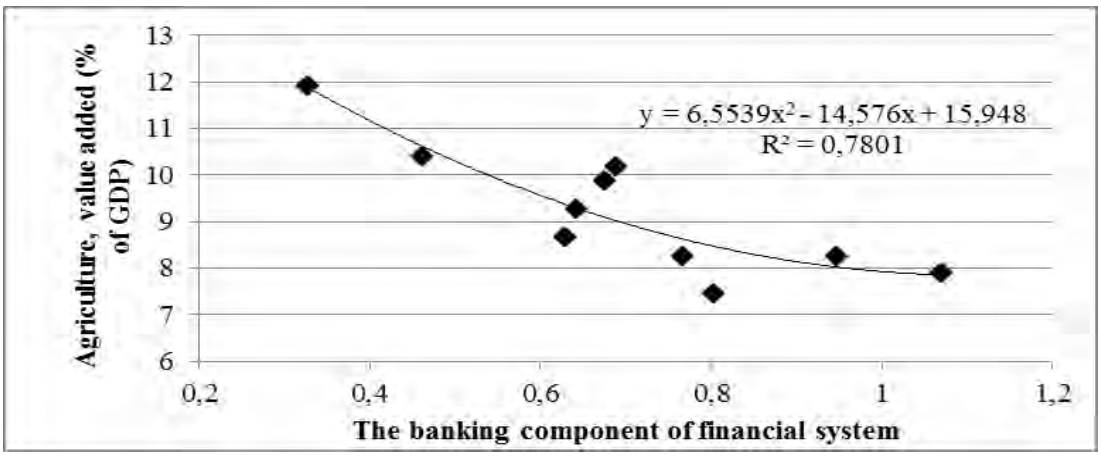
Figure 4: Regression model that describes the relationship between integral indicator of the banking component of financial system and agriculture, value added (% of GDP) in Ukraine 2004 – 2013



Source: author calculations based on data (World Bank 2016a, 2016b).

To confirm this preliminary conclusion we attempted to check two hypotheses based on statistical data of the National bank of Ukraine.

The first hypothesis: the presence of the above mentioned inverse correlation is the result of the fact that the development of Ukrainian agriculture is less dependent on bank credit compared to other sectors of the economy. According to this hypothesis, the development of banking component in Ukraine has to lead to increase in value added of more credit-dependent sectors as share of GDP with the decrease of share of agriculture, which is less credit-dependent branch of the economy.

According to analysis, this hypothesis is not confirmed. In a result, comparison of the lending and economic activity volume dynamics at current prices revealed that the volume of agricultural production is more sensitive to changes in lending than to the activity of other industries and the economy as a whole (Table 3).

Table 3: Simple linear regression model parameters describing the relationship between the volume of lending and the volume of economic activity at current prices in Ukraine in 2004-2013

Industry	The indicator of the economic activity	Parameters		R-squared values
		slope coefficient	constant	
Agriculture	Gross output	5.061	49.617	0.9224
Trade	Retail turnover	1.619	29.481	0.9616
Economy as a whole	GDP	1.265	265.5	0.9037

Source: author calculations based on data (World Bank 2016a, 2016b; NBU 2015).

Particularly, in trade, which during the period of the study was the driver of economic growth in Ukraine, the UAH 1 increase in lending was accompanied by UAH 1.62 growth in retail turnover on average, while in agriculture – by UAH 5.06 growth in gross output. While comparing agriculture to the economy as a whole, it is possible to identify the 4 times excess sensitivity of this branch to changes in lending. It is observed that the gross output of agriculture increases exponentially in the case of bank lending growth in this sector and nominal GDP growth becomes slower if bank lending volumes in economy decrease (Figure 5, 6). Similarly, slowdown can be seen in the retail trade turnover in the case of volumes of trade sector crediting shrink.

Revealed patterns not only deny the first hypothesis, but also illustrate the importance of bank financing for the development of Ukrainian agriculture, being is even of higher significance for it than for most of other sectors and for the economy as a whole.

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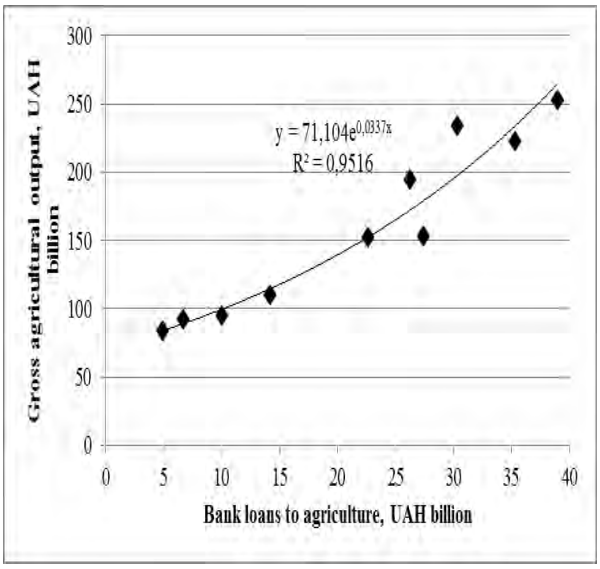
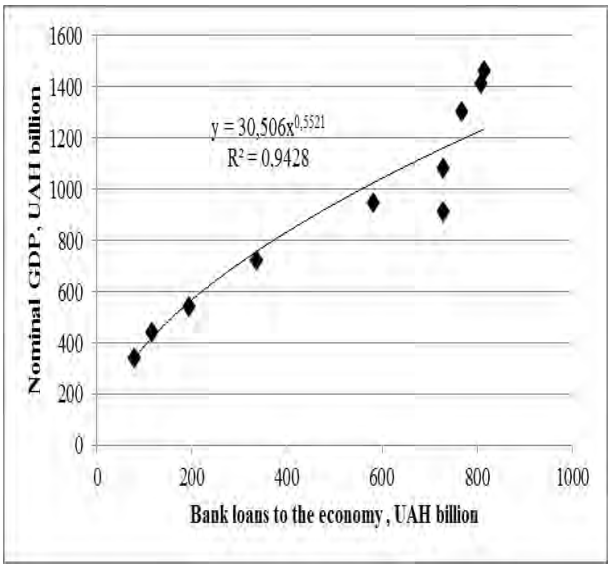
Figure 5. Regression model that describes the relationship between the volume of bank loans to agriculture and the gross agricultural output in Ukraine, 2004 - 2013 (at current prices)



Source: author calculations based on data (World Bank 2016a; NBU 2015).

Figure 6. Regression model that describes the relationship between the volume of bank loans to the economy and nominal GDP in Ukraine, 2004 - 2013 (at current prices)



Source: author calculations based on data (NBU 2015).

The second hypothesis: the existence of inversely proportional relationship between the development of the banking component of the financial system and value added in agriculture (% of GDP) in Ukraine is connected with the fact that the indicator that characterizes the performance of the banking sector - domestic credit to private sector by banks (% of GDP) - has inadequate dynamics if the bank loans elasticity to GDP is greater than one. In this case, the banking sector development, accompanied by growth in lending to the real sector, leads to relatively higher GDP growth, as a result the domestic credit to private sector by banks (% of GDP) is decrease.

The analysis of interdependence between the volume of bank credits at current prices and nominal GDP in Ukraine for the period from 2004 till 2013 provides an argument in favor of the second hypothesis – an increase in lending is accompanied by relatively higher GDP growth (as shown in Table 3, the UAH 1 increase in lending is accompanied by an average UAH 1.265 GDP growth). Thus, the existence of inversely proportional relationship between the integral indicator of the banking component of the financial system and agriculture, value added (% of GDP) in Ukraine is not the evidence of the negative financial system development impact on agriculture.

The importance of financial system development (particularly its banking component) for agriculture of Ukraine is confirmed by regression model that describes the relationship between bank deposits to GDP (%) and value added per worker in agriculture (constant 2005 US $) – see Figure 7. This model provides an exponential growth rate of value added per worker in agriculture, which may indicate the existence of substantial potential for productivity increase in agriculture, which can be reached with stimulation of financial system development through increase of its resource base. It should be noted that the positive relationship between bank deposits to GDP (%) and value added per worker in agriculture (constant 2005 US $) for the period from 2004 to 2013 was observed also in the US (Figure 8) and in many other countries with developed agriculture.

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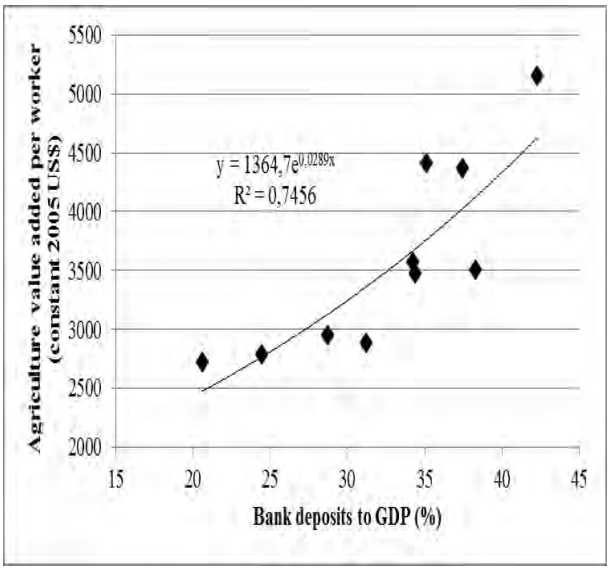
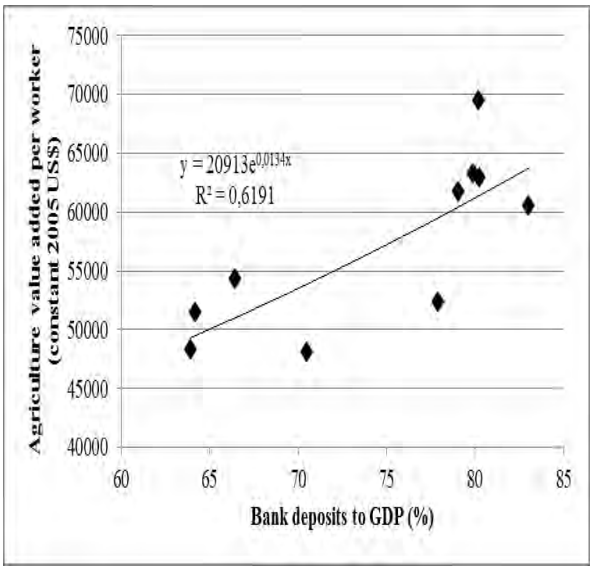
Figure 7. Regression model that describes the relationship between bank deposits to GDP (%) and Agriculture value added per worker (constant 2005 US$) in Ukraine, 2004 - 2013



Source: author calculations based on data (World Bank 2016a; NBU 2016).

Figure 8. Regression model that describes the relationship between bank deposits to GDP (%) and Agriculture value added per worker (constant 2005 US$) in USA, 2004 - 2013



Source: author calculations based on data (World Bank 2016a; FRS 2015).

Market component of the financial system, unlike the banking component, is characterized by absence of significant statistical dependence of certain aspects of agricultural growth of Ukraine, taking into consideration the integral indicator as well as its separate components.

4. Conclusion

This study provided that financial system has positive impact on agriculture growth in Ukraine, despite the lack of significant statistical dependency between the relevant integral indicators in Ukraine. We proved that banking component of the financial system make a significant impact on agriculture grows, as evidenced by regression models built on the basis of effectiveness and resource base indicators.

We found that the indicator "domestic credit to private sector by banks (% of GDP)", which was used to characterize the performance of the banking sector as part of the integral indicator of financial system development, showed specific dynamics in case of Ukraine. It means when the amount of loans was increased the level of indicator was decreasing over 2004-2013. The reason of that it was a high dependence of Ukrainian economy on bank lending, which was reflected to the high elasticity of GDP to changes in lending. The specific dynamics of indicator "domestic credit to private sector by banks (% of GDP)" may be considered as one of the reasons for the absence of statistical dependence between the integral indicators of financial system development and agricultural growth. As evidenced by the results of the study, agriculture is much more dependent on bank lending than the vast majority of other branches of economy.

The results indicate the feasibility of scientific search for the ways to increase the efficiency of agricultural activities in Ukraine due to the creation of conditions for further development of financial system, especially its banking component.

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The effect of financial performance on company's value moderated by dividend policy

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Abstract
Theobjective of the study was to analyze the effect of financial performance on company's value moderated by dividend policy. Research variables consist of financial performance, dividend policy, and company's value. Financial performance measured by liquidity, leverage, and profitability. Dividend policy was represented by dividend payout ratio. And last variable. company's value was presented by Tobin's Q. Data was purified from annual financial repot of18insurance and banking companies.Those 18 companies were listed in Indonesia Stock Exchange during the period 2010-2013. Data were analyzed using moderating regression analysis. There was evidence that financial performance did not affect the company's value. It was also showed that dividend policy did not moderate the effect of financial performance on company's value.

Keywords:*banking company,company's performance, company's value, dividend policy, Indonesian Stock Exchange, insurance company.*

JEL classification*: D53, G210, G220*

1. Introduction

Studies on company's performance, company's value, and dividend policy have been done extensively by many scholars. Regardless the extensive of the studies, the relationship among financial performance, dividend policy, and company's value are yet debateable. Researchersopinion related to relationship of dividend policy and company's valuecan be differentiated into 2 mainstreams. First opinion showed that dividend policy relevant with company value (Dhanani, 2005; Kouki and Guizani, 2009; Howatt, 2009), which is well known on signaling and bird in hand theories.The second opinion, follow Miller and Modigliani (1961), that dividend policy does not influence company's value (such as Farsio, Geary, and Moser, 2004). Among researchers supported the first opinion, again come up with different argument. First opinion showed that dividend policy influences company's value positively (such as Howatt, 2009; Amidu, 2007; Kouki and Guizani, 2009). Dividend is the proportion of profits which is distributed to shareholders in a proportional amount to the number of shares owned. Subsequently, dividends may affect the stock price. In the case ofdividend is high, the stock prices will tend to be high and so does the company's value. If dividend is low, the stock prices will tend also to be low. In contravention, it shows that company's value influence dividend policy negatively (Farrar and Slewyn, 1967; Litzenberger, 1980; Rozeff, 1982; Eastebrook, 1984).

Related to company performance and dividend policy, a number of studies have been done (such as Amidu, 2007; Howatt, 2009; Arnott and Asness 2003; Farsio, Geary, and Moser 2004; Fama and French, 2001).Their studies emerged the question of causality direction. Two mainstreams emerged. First group revealed that dividend policy affects company performance (Fama and French, 2001;Arnott and Asness, 2003; Zhou and Ruland, 2006; Howatt, 2009;Amidu, 2007). Positive changes in dividends are associated with positive future changes

in earnings per share (Arnott and Asness, 2003; Zhou and Ruland, 2006; Howatt, 2009). Arnott and Asness (2003) and Zhou and Ruland (2006) used profitability in representing company performance. Amidu (2007) showed a positive and significant relationship between return on assets, return on equity, growth in sales and dividend policy. Fama and French (2001) proofed that dividend paying firms tend to be large and profitable, while non-payers are typically small, less profitable but with high investment opportunities.

In contravention, others researchers showed the opposite relationship. In this stream, it shows that company performance influence dividend policy (such as Murekefu and Ouma,). It shows thatif the company makes a high profit, then the company will pay dividend highly. Murekefu and Ouma give evidence that company performance which are measured using financial performance affects dividend policy. Financial performance on their study are constructed using liquidity, profitability, leverage, More extreme, Lie (2005) and Farsio, Geary, and Moser (2004) showed there's no relationship between dividend policy and company performance. Lie (2005) argues that there is limited evidence which supportthe improvement of company performance when company pay dividend.

There are many ways to represent company's performance. Among them, the most commonly used, especially on stock market by investors is financial performance.Subsequently there are many indicators of financial performance. Financial performance in the forms of ratios cover a number of concepts and be grouped into profitability, liquidity, leverage, investment-shareholders ratio, and utilization. The effect of company's performance on company's value provides a maximum wealth to shareholders when the stock prices rise. The higher the stock price of a company, the higher the wealth of the shareholders(Jensen, 2010;Fama, 1978; Wright and Ferris, 1997; Walker, 2000). Enterprise value or known as company's value is an important concept for investors, because it's an indicator for assessing the company's overall market. Company's value in another side is affected by several factors,such as corporate risk-taking (Baugess, Slovin, and Sushka, 2012; Houston, Lin, Lin, and Ma, 2010; John, Litov, and Yeung, 2008), funding decisions, investment decisions (Azhagaiah and Priya, 2008), capital structure (Azhagaiah and Priya, 2008), company's growth and company's size.

Exploring the relationships between company's value and dividend, as well as between company performance and dividend, motivated the idea that instead of influence company's value, dividend policy moderates the relationship between financial performance and company's value.Thus the objective of the study was to examines the effect of financial perfomance on company's value moderated by dividend policy.

This study contributes to the literature in several ways. First,financial sector can be both a growth engine and a source of economy-wide fragility and crisis.Since 1997, huge financial crisis continuing economy crisishas downed Indonesia to bid and long suffer.Levine (2005) and Beck (2009) for instance showed that financial deepening is a critical part of the overall development process of a country. The study will further our understanding of how the relationship among variables on Indonesian stock exchange case. Secondly, dividend policies vary across countries (Abdelsalam, El-Masry, and Elsegini, 2008; LaPorta,Lo´ pez-de-Silanes, Shleifer, and Vishny, 2000), so thus the relationship between variables. There are distinct differences between Indonesian and developed countries markets. This study will enrich the literature related to dividend policy, company performance, and company's value relationship.

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2. Data and Method

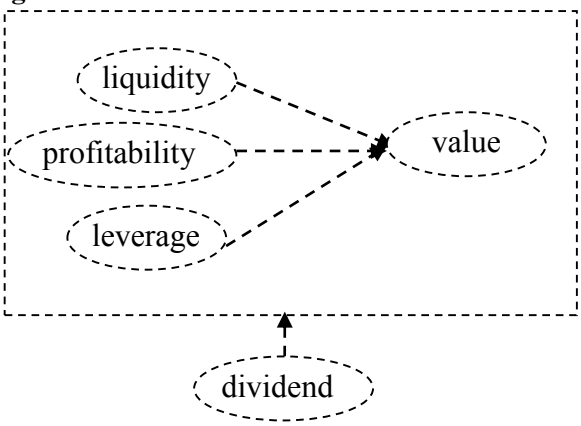
2.1.Data Set and Sample

This study made use of secondary data. Data was generated from annual report during the period 2010-2013. The data were accessed through the official website of Indonesia Stock Exchange (www.idx.co.id) to retrieve financial reports and the website of Yahoo Finance (www.yahoo.finance.com) to retrieve company's share price.Annual financial report and share price were used to calculate the measure of all research variables, as shown on Fig. 1.

The sample includes all of insurance and banking companies listed on Indonesia Stock Exchange. Other criteria that deployed in selecting sample were:

- Company distributed dividend for 4 consecutive years (2010-2013).
- Company provided complete annual financial report during 2010-2013.
- While there are many ways to represent company's performance, company's financial performance is used by potential investors to determine stock investment. So thus company's performance in this study was represented by company's financial performance. Among company's financial indicators, liquidity ratio, leverage ratio, and profitability ratio were used to represent financial performance. Further, liquidity was constructed using cash ratio. Leverage ratio was constructed using deb to equity ratio; and finally, profitability was constructed using return on equity (ROE) ratio. All those ratios were calculated based on annual financial report. Dividend policy was measured using dividend payout ratio (DPR). Company's value was measured using Tobin's Q. Again, annual financial report was deployed to calculateDPR and Tobin's Q.

Figure 1. Research model



2.2.Data Analysis

The appropriate technique to test the interaction type of fit is by using moderated regression analysis (MRA).According to Champoux and Peters, (1987) and Southwood(1978) moderated Regression Analysis (MRA) is aspecific application of multiple linear regressionanalysis, in which the regression equation containsan `interaction term' (multiplication of two or more independent variables). Interaction on this study was multiplication betweenfinancial performance and dividend policy. The formula was:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Z + \beta_5 X_1.Z + \beta_6 X_2.Z + \beta_7 X_3.Z + e.$$

Symbols X_1, X_2, and X_3 represent liquidity ratio, leverage ratio, and profitability ratio respectively. DPR and Tobin's Q were represented by Z and Y respectively. Prior to data

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analysis using MRA technique, classic assumption test was performed to test normality, multicollinearity, autocorrelation, and heteroscedasticity.

3. Results and Discussion

3.1.Descriptive Statistics Results

Applying the criteria for the sample as mentioned above, it was identified 18 banking and insurance companies. At first step, we calculated liquidity ratio, leverage ratio, profitability ratio, and Tobin's Q based on financial report, and DPR for 18 companies. Table 1 shows the result of calculation. We did not group the sample into banking and insurance company. The minimum value of Tobin's Q was 0.35 which was shown by Bank Rakyat Indonesia firm. The maximum value was 1.460 which was shown by ABM Investama firm. The average value of Tobins Q (1,017) indicated that the effectiveness of the company's management in utilizing the economic resources was 1.017 %. For liquidity indicator, the minimum and maximum ratio respectively were shown by Bank Tabungan Negara and Asuransi Bina Dana Arta firms. Cash ratio was deployed to represent liquidity ratio. Based on the average value of cash ratio, it can be stated that generally company is able to repay 59 % its short term debt.

Table 1 Descriptive Statistics Results

	N	Minimum	Maximum	Mean	Std. Deviation
Tobin's Q	18	.350	1.460	1.01778	.256482
Liquidity	18	.006	.320	.05978	.076049
Leverage	18	.688	10.852	5.50778	3.449963
Profitability	18	.065	.674	.24350	.137666
Dividend Policy	18	.100	.630	.32884	.132327
Liquidity Moderated by Dividend Policy	18	.01	.68	.1745	.17921
Leverage Moderated by Dividend Policy	18	.00	.69	.1722	.18175
Profitability Moderated by Dividend Policy	18	.03	.57	.1858	.15000
Valid N (listwise)	18				

Based on leverage ratio, the minimum value was shown by Asuransi Bina Dana Arta firm whilst the maximum value shown by Bank Himpunan Saudara 1906 firm. Debt to equity ratio was used to represent leverage ratio. Debt to equity ratio is a financial ratio indicating the relative proportion of shareholders' equity and debt used to finance a company's assets (Peterson, 1999).

The last indicator for financial performance, profitability, was represented by return on equity ratio. Return on equity is the amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. The minimum value of this indicator was shown by ABM Investama firm. The maximum value was shown by Asuransi Harta Aman Pratama firm.

Dividend policy which was represented by DPR, Bank Nusantara Parahyangan firm shown the minimum value of DPR, whereas Bank Jatim firm described the maximum value of DPR. The dividend payout ratio provides an indication of how much money a company is returning to shareholders, versus how much money it is keeping on hand to reinvest in growth, pay off debt or add to cash reserves. An average 32.8% indicated generally 32.8% of money was distributed to shareholders.

3.2. Classic Assumption Test Results

Prior to data analysis using MRA, classic assumption test was performed. Table 2 shows normality, multicolinearity, heterocedastisity and autocorellation test results. It shows that classical assumption test was fulfilled which leads to appropriateness of using MRA technique.

Table 2 The Classic Assumption Test Results

Variables	Normality	Multicolinearity	Autocorrelation	Heteroscedastisity
Y	√	√	√	√
X1	√	√	√	√
X2	√	√	√	√
X3	√	√	√	√
X4	√	√	√	√
X5	√	√	√	√
X6	√	√	√	√

3.3.Model Validation

In order to validate research model proposed on Figure 1, MRA technique was run. Using F value from ANOVA, it's shown that significance value was 0.907. The significance value in order to accept the model is less than 0.05. The significance value in this case was greater than 0.05. So thus we could conclude that proposed model was rejected. It implied that the relationship between financial performance, which was represented by liquidity, leverage, and profitability ratio, with company value (measured by Tobin's Q) did not moderated by dividend policy (measured using DPR).

From similar output, we may investigate the effect of each indicator on company value partially. The result using t-test is presented on Table 3.

Table 3T-value and the significance

Variable	t-value	Significance
Equation		
Constant	3.799	0.003
Liquidity	-0.378	0.713
Leverage	0.131	0.899
Profitability	-0.690	0.506

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Dividend Policy	0.123	0.904
Liquidity*Dividend Policy	-0.262	0.799
Leverage*Dividend Policy	0.157	0.879
Profitability*Dividend Policy	0.129	0.900

All significance value was above 0.05. It implied that liquidity, leverage, or profitability did not influence company value partially. The significance value of all interaction was also above 0.05. It meant dividend policy did not moderate the relationship between financial performance indicators with company value.

3.4. Discussions

The aforementioned result apparently showed financial performance did not affect company's value. This result was not surprisingly for Indonesian market. Many researches showed that liquidity (such as Handayani, 2011; Mahendra, 2011; Agustia, 2010), leverage (Mahendra, 2011), and profitability do not affect company's value. Compare to stock market abroad, most commonly the result was in contrary. However, the study of Ghos and Cai (2004), Ramlall (2009), and Carpenter (2006) showed the same result with this study, where they provided evidencethat profitability does not influence company's value.

The contrary of this result with previous studies can be explained by the following supporting theory:although liquidity, leverage, and profitability are group of ratiosmost commonly and frequently use to depicts financial performance, but among those variables are exist causality. For instance, leverage influence profitability (which is measured using return on investment (ROI)) negatively. In another hand, liquidity, leverage, and profitability ratios can be measured using various indicators. The evidence on this study showed that for Indonesian market stock of banking and insurance companies, cash ratio was not suitable expression of liquidity.Similar logic can be apply to leverage and profitabilityratios, in such that debt to equity ratio andROE were not suitable expression for leverage and profitability ratios respectively.

Profitability when measured using return on asset (ROA) is consistent with a signaling perspective (Miller and Rock (1985). In this case, dividend payout may correlate positively with profitability (Jensen *et al.,*1992; Kowalewski et al, 2007). This variable is defined as the mean ratio between after-tax earnings before extraordinary items and total assets. Firms pay higher dividend when they realize a comfortable financial situation.

Another aspect that leads to this study result is company's value is not only affected by company performance but also by several factors,such as corporate risk-taking (Baugess, Slovin, and Sushka, 2012; Houston, Lin, Lin, and Ma, 2010; John, Litov, and Yeung, 2008),funding decisions, investment decisions (Azhagaiah and Priya, 2008), capital structure (Azhagaiah and Priya, 2008), company's growth and company's size. For the case of Indonesian stock market of banking and insurance companies during 2010-2013 periods, corporate risk-taking, funding decisions, investment decisions, capital structure, company's growth, and company's size perhaps provide more dominant effect on company value.

4. Conclusions

We can conclude for banking and insurance industries, which were listed on Indonesia Stock Exchange and paid dividend continuously during 2010-2013, financial performance did not influence company's value. Neither dividend policy moderated the relationship between financial performance and company's value.As shown by previous studies on stock market abroad, we suggested to consider correlation between financial performance indicators in future research.Dividend policy chosen in this study was DPR, which is cash dividend and earnings measured after taxes and interests. The measurement of dividend policy probably is more appropriate by capital gain since Indonesianinvestors generally might are less likely not to use stock repurchase.

Company's value as well can be measured using various indicators, i.e market-to-book-ratio (M/B), Tobin's Q, Calculated Intangible value (CIV), and Return of Management (ROM). We used Tobin's q in this study. It is possible that in banking and insurance companies in Indonesia, ratio of market value to firm asset replacement cost is not appropriate indicator for dividend policy. So thus with liquidity, leverage, and profitability ratios, there exist various indicators for those ratios. The last suggestion therefore forfuture research is to combine indicators in determiningthe appropriate indicator of each variable for Indonesian stock market.

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The development of value added and net income of farms in Slovakia

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Abstract
The article is focused on the assessment of the current state and development of efficiency of the agricultural enterprises in Slovakia for the time horizon 2009-2013 according to the FADN methodology. Partial objective of the paper is to compare the level of the Slovak agriculture in the year 2013 with the selected EÚ-28 member states. Performance and efficiency of the Slovak agriculture and its comparison with individual EU states is mainly evaluated by the total production, by the gross farm income, farm net value added and by farm net income. Assessment of the state and development of the performance and efficiency of Slovak agriculture and its comparison with selected EU member states leads to the solution of farm value added and farm net income creation through the harmonizing the science knowledge, political decisions and reality.

Key words: *Gross Farm Income, Farm Net Value Added, Net Farm Income, Effectiveness, Intensity*

JEL classification: *Q12, Q14*

1. Introduction

World agriculture development objectives should take into account the irreplaceable function of agriculture in economic and social fields, pre-production facilities, environmental security of the population, development and protection of the landscape, ecological functions, stability, rural development and others.

Public support for agriculture should be based on objective valuation of social benefits of agriculture for society (public goods). In the opinion of several experts, to evaluate the cross-sector position of agriculture only by share of GDP, by share on employment and by share on foreign trade is not representative.

Results of production in agriculture can be seen in natural and value terms. Value terms have essential meaning in evaluating of economic results and financial indicators. In EU agriculture the added value is considered as an indicator of its production performance. Net income from business activities in agriculture reflects the synergy effect of the reproduction process of production activities in agriculture.

Varoščák, J. – Grznár, P. (2010) argue that even in the recent past categories - such as the intensity of agricultural production, yields per hectare and the livestock's' performance were the main criteria for assessment and evaluation of agricultural producers and the social role of agriculture. At present, for the evaluation and improvement of the Slovak agriculture performance are important criterions of efficiency of the economy - a condition where the economy does not waste resources, but resources are efficient and fully used, competitiveness and the creation of public goods - as a socially recognized agricultural outputs.

According to Serenčéš, P. – Tóth, M. (2012) the key problem of low efficiency of Slovak agriculture is a low level of added value which is compensated by public resources in the form of subsidies. Low level of added value results in the high share of depreciation on gross value added as well as the high proportion of labor costs on net added value. Therefore the profit for the owner of agricultural production is very low.

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The source for the increase in value added by Serenčéš, P. – Tóth, M. (2012) should be green growth (comprehensive land management), as the core of rural development strategy. It includes the modernization and innovation, new methods of research and development and lifelong education of the rural population.

In the current era of globalization, especially after the accession to the EU, the position of agriculture is changing especially in the trend of EU CAP reforms. On the other hand according to Rovný, P. – Dobák, D. – Čierna, Z. (2015) there exists the basic problem in Slovakia. It is the fact that there are very few farms which their products process into the final products respectively semi-finished products. These final products or semi-finished products have a higher added value and farmers are benefiting from its own production. In this case for evaluation of production would be needed lower area of agricultural land to ensure basic expenses.

2. Data and Methodology

Slovakia's accession to the European Union meant for Slovak Agriculture duty to evaluate the performance by common methodology of the EU.

The **F**arm **A**ccountancy **D**ata **N**etwork (FADN) is an instrument for evaluating the income of agricultural holdings and the impacts of the Common Agricultural Policy launched in 1965. It consists of an annual survey carried out by the Member States of the European Union. Derived from national surveys, the FADN is the only source of microeconomic data that is harmonised, i.e. the bookkeeping principles are the same in all countries. The survey does not cover all the agricultural holdings in the Union but only those which due to their size could be considered commercial. (http://ec.europa.eu/agriculture/rica/database/database_en.cfm (2016-02-26)).

Article evaluates the development of the selected indicators they evaluate the Slovak agriculture performance for the last 5 years (2009-2013) according to the methodology of the FADN. Then on the last available data, in 2013, the position of Slovak agriculture is compared with the average for the EU-28 and the selected EU Member States such as Czech Republic, Germany, France, Hungary, Netherlands, Austria and Poland.

Table 1: Farm represented and Total Utilised Agricultural Area (ha) (Slovakia 2009 – 2013)

	Farms represented	Total Utilised Agricultural Area (ha)
2009	4 160	525,72
2010	4 290	508,77
2011	3 900	552,91
2012	4 160	521,50
2013	3 390	594,82
Average	**3 980**	**540,74**

Source: FADN database, calculation of authors

Table 1 shows the number of farms in a representative sample for the Slovak Republic in the examined period 2009-2013, the average number of farms for the period and average acreage per farm for examined period. There were evaluated results in average for 3 980 farms in

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examined period in Slovak Republic. The average size of farms in Slovakia in examined 5-year period is 540,74 hectares.

Table 2: Farm represented and Total Utilised Agricultural Area (ha) (Selected EU countries in 2013)

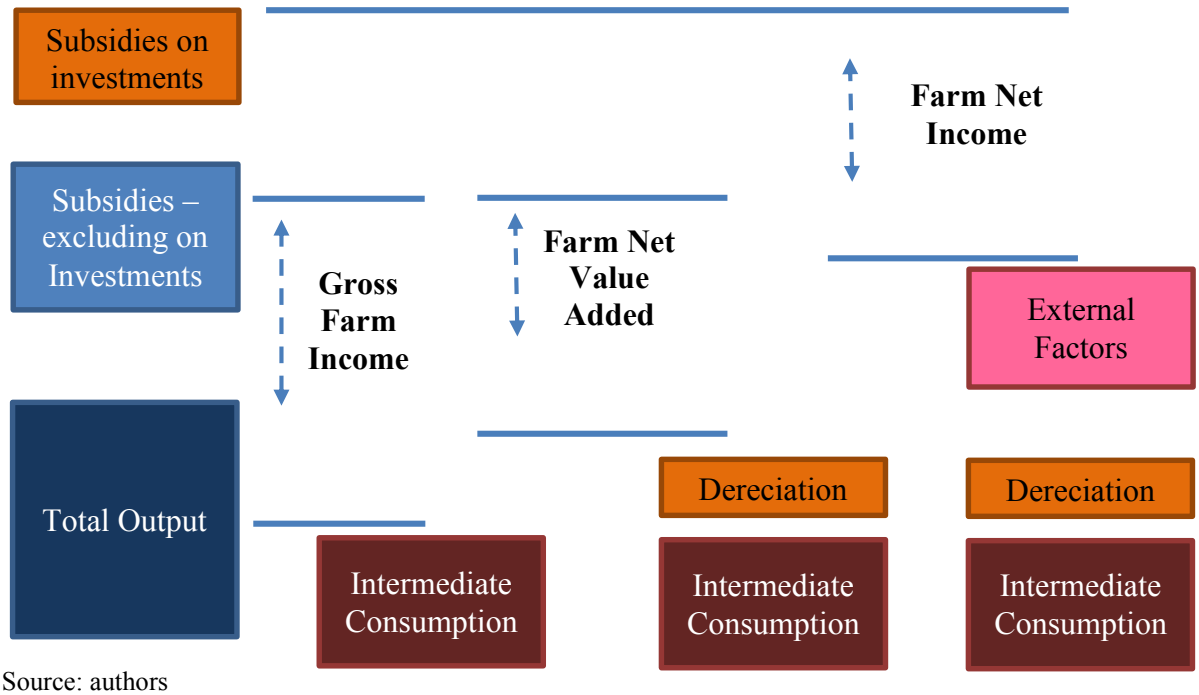
	Farms represented	Total Utilised Agricultural Area (ha)
Czech Republic	14 840	232,93
Germany	193 940	86,63
France	304 690	85,87
Hungary	107 260	45,02
Netherlands	52 200	34,61
Austria	92 990	32,39
Poland	720 630	19,11
Slovakia	3 390	594,82

Source: FADN database, calculation of authors

In the same way table 2 shows the number of farms in the sample for each selected EU-28 country and the average acreage of farm in each selected country.

The article compares the state and development of the following indicators: total output, current subsidies and subsidies on investments, intermediate consumption, depreciation, external factors (labour costs, rent and Interest costs), gross farm income, farm net value added and farm net income. Indicators are expressed per farm in EUR or in percentage terms.

Chart 1: Creation of Gross Farm Income, Farm Net Value Added and Farm Net income



Source: authors

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Chart 1 shows creation of the gross farm income, of the farm net value added and farm net income.

3. Results and Discussion

The characteristic sign of the selected sample of the EU countries is area of the farm. The average area of land per farm in the Czech Republic is 232,93 ha, in Germany 86,63 ha, in France 85,87 ha, in Hungary 45,02 ha, in Netherlands 34,61 ha, in Austria 32,39 ha, in Poland 19,11 ha and in Slovak Republic 594,82 ha.

Table 3: Total Output, Intermediate Consumption and Farm Net Value Added per hectare (Slovakia 2009 – 2013)

	Total Output	Intermediate Consumption	Farm Net Value Added
2009	689,42	745,48	67,58
2010	760,74	706,43	156,67
2011	1 071,03	846,53	304,73
2012	998,59	833,94	269,25
2013	1 024,98	835,58	296,02

Source: FADN database, calculation of authors

Before analysing the situation and development of the total output, intermediate consumption and farm net value added, used indicators were calculated per hectare for the years 2009-2013 in Slovakia and in each of the selected EU countries in 2013 (Table 3 and 4).

Table 4: Total Output, Intermediate Consumption and Farm Net Value Added per hectare (Selected EU countries in 2013)

	Total Output	Intermediate Consumption	Farm Net Value Added
Czech Republic	1 479,88	1 115,28	595,04
Germany	3 078,69	2 026,64	1 105,48
France	2 281,20	1 487,47	729,77
Hungary	1 455,06	1 011,28	640,78
Netherlands	14 164,92	8 780,96	4 272,32
Austria	2 323,40	1 412,53	926,58
Poland	1 642,60	1 062,32	625,38
Slovakia	1 024,98	835,58	296,02

Source: FADN database, calculation of authors

Total production of Slovak farms per hectare for period of years from 2009 to 2013 showed a year on year growth and over the years increased by 68%. Comparing the level of the total production per hectare with the selected EU countries Slovakia showed the lowest value of 1 024,98 EUR.

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Intermediate consumption per hectare of farms in Slovakia also shows increasing trend in period 2009-20013 but lower as the increase of the total production (increase of 12%.). Comparison of intermediate consumption per hectare of farms in Slovakia in 2013 with selected EU countries also shows the lowest value of 835,58 EUR.

Net value added of the Slovak agricultural farms per hectare for the years 2009-2013 has recorded growth among years and over the years under review increased 4,3 times. In assessing the level of net added value achieved in farms in Slovakia in 2013 with selected EU countries we can again confirm the lowest level of 296,02 EUR.

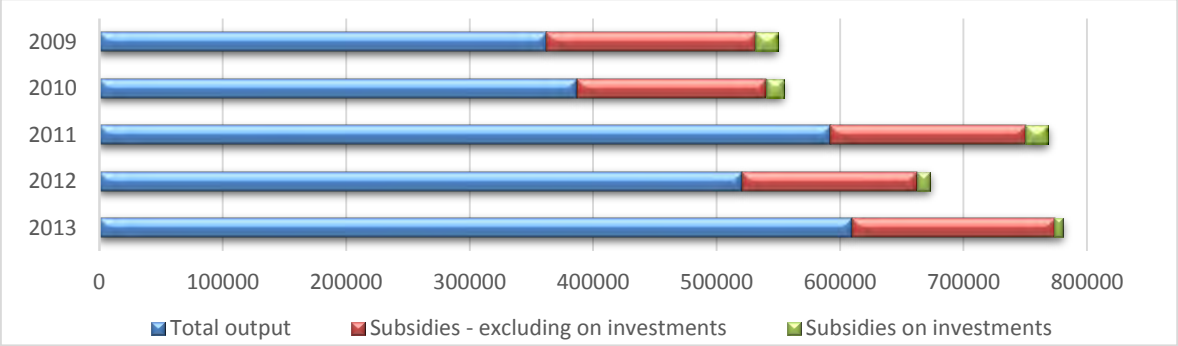
The big problem is that nowadays in the agricultural sector in Slovakia is a high proportion of enterprises that deal with only primary agribusiness (crop production and animal husbandry) without producing products of higher added value, i.e. finalization (milk, cheese, meat, specialty products, local products, unique products). Here is hidden very high employment potential in rural areas.

In further analytical work we will focus on the assessment of individual indicators at the farm (farm) in Slovakia and in selected EU countries.

3.1 Development of the total production and subsidies

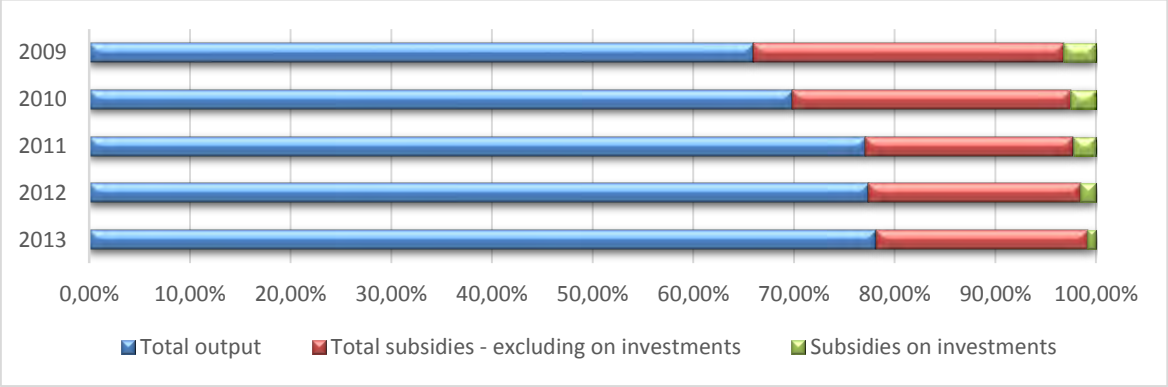
Total agricultural output represents the sum of the values of crop and animal production, services for agricultural primary production and inseparable non-agricultural secondary activities.

Chart 2: Total Output and Subsidies per Farm in € (Slovakia 2009-2013)



Source: FADN database, calculation of authors

Chart 3: Total Output and Subsidies per Farm in % (Slovakia 2009-2013)



Source: FADN database, calculation of authors

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Total production in the Slovak agriculture has increased in 2013 compared to 2009 by 68%. Subsidies - excluding on investment for the period fell from 2009 to 2012 and in the last year again increased. In 2013 compared to 2009, there was only a slight decrease in the amount of 3,04%.

Subsidies on investments in agriculture recorded during the reporting period 2009-2013 decrease and in 2013 subsidies in investments reached the lowest level on a farm 6 724 EUR (2013/2009 index is 0,38).

There are not only changes in trends of growth resp. of decrease in total agricultural production, in subsidies - excluding on investments, in subsidies on investments during the years 2009-2013 in the Slovak agriculture, but also the structure and weight of the individual components of the performance of agriculture.

Table 5: Total Subsidies-excluding on investments / Total Output in % (Slovakia 2009 – 2013)

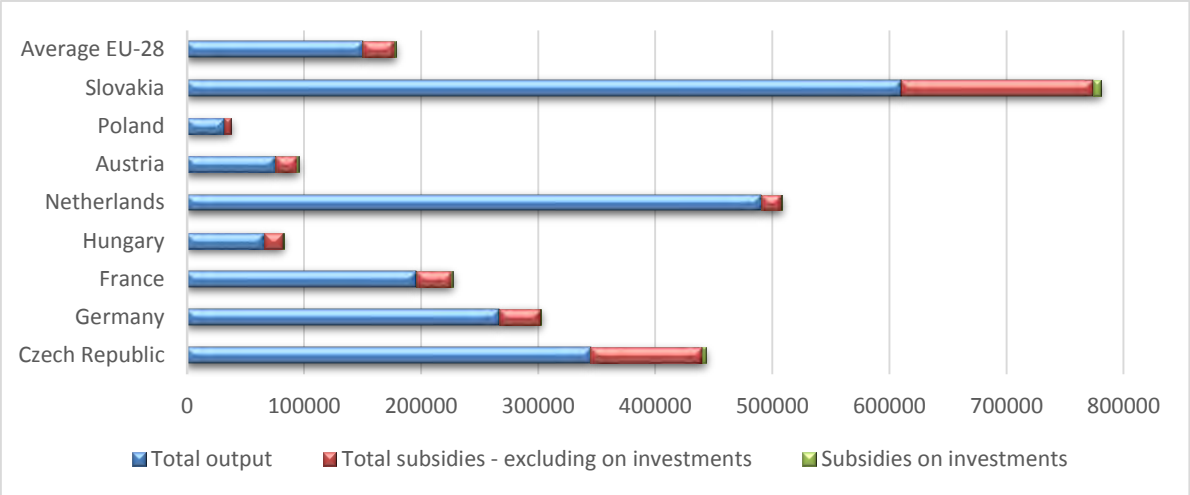
	2009	2010	2011	2012	2013
Slovakia	46,68	39,56	26,73	27,21	26,91

Source: FADN database, calculation of authors

The share of the subsidies (excluding on investments and subsidies on investments) in Slovak agriculture on total agricultural production recorded since 2009 an annual decrease (in 2013 a slight increase).

While the article is not focused on analysing the relationship between subsidies and growth resp. decrease of the total agricultural production, because it requires a comprehensive approach, despite of it we can add the significant decrease in relation to mentioned components by 42% to significant growth of the total agricultural production and to stagnation of the subsidies over the analysed period 2009-2013 in Slovak agriculture (Table 5).

Chart 4: Total Output and Subsidies per Farm in € (Selected EU countries in 2013)



Source: FADN database, calculation of authors

From the comparison of the proportion of total agricultural production and subsidies in selected EU countries we conclude that the Slovak agriculture (farm) has the lowest percentage (78,02%), while countries such as the Netherlands (96,67%), Germany (88,45%) and France (86,76%) have a substantially smaller share in that relationship.

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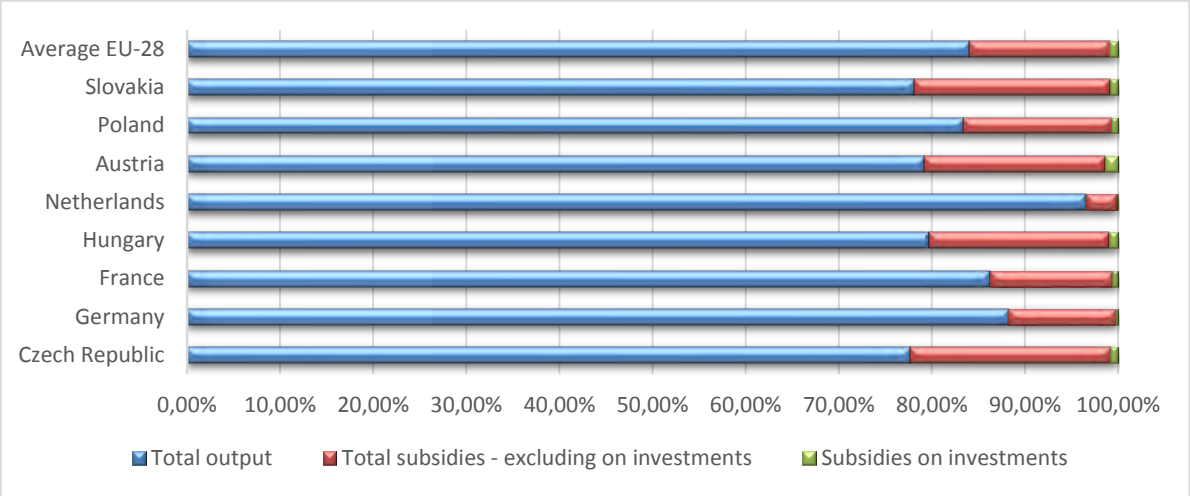
Chart 5: Total Output and Subsidies per Farm in % (Selected EU countries in 2013)

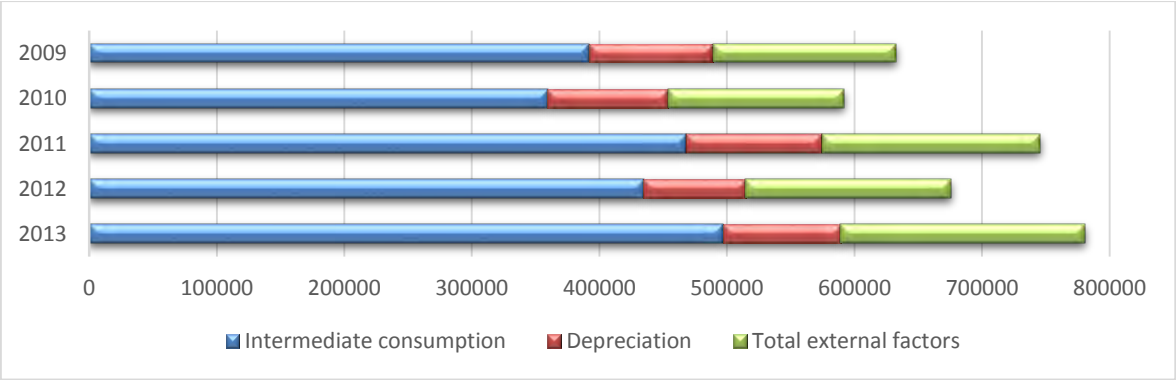


Source: FADN database, calculation of authors

3.2 Intermediate consumption, depreciation and external factors

Varoščák, J. – Grznár, P. (2010) state that intermediate consumption represents the value of purchased materials, services and energy, including consumption of goods and services that are delivered within a company by affiliated units, shortages and damages to inventories and other costs included in intermediate consumption. When net income of agriculture is created its intermediate consumption is considered as a crucial component. An essential aspect of the development of intermediate consumption of agriculture is also the steady rise in prices of its components. These considerations leads to the fact that in agricultural practice may be intermediate consumption considered as a production-economics priority as in relation to the structural meaning as in value meaning

Chart 6: Intermediate Consumption, Depreciation and External Factors (Wages, Rent and Interest paid) per Farm in € (Slovakia 2009 – 2013)



Source: FADN database, calculation of authors

Consumption of fixed capital, defined as the value of depreciation and value of disposed fixed assets is consumption of worn tangible and intangible assets recognized within the current time period - a calendar year, as stated by Varoščák, J. - Grznár, P. (2010).

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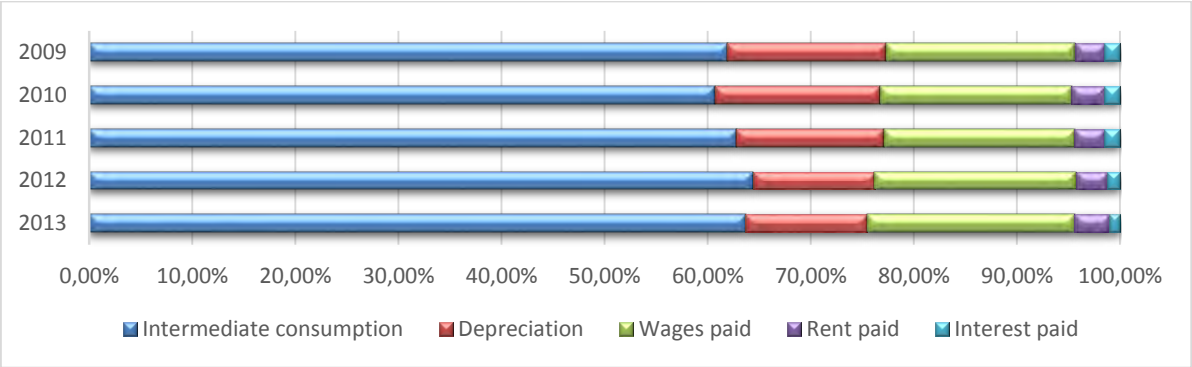
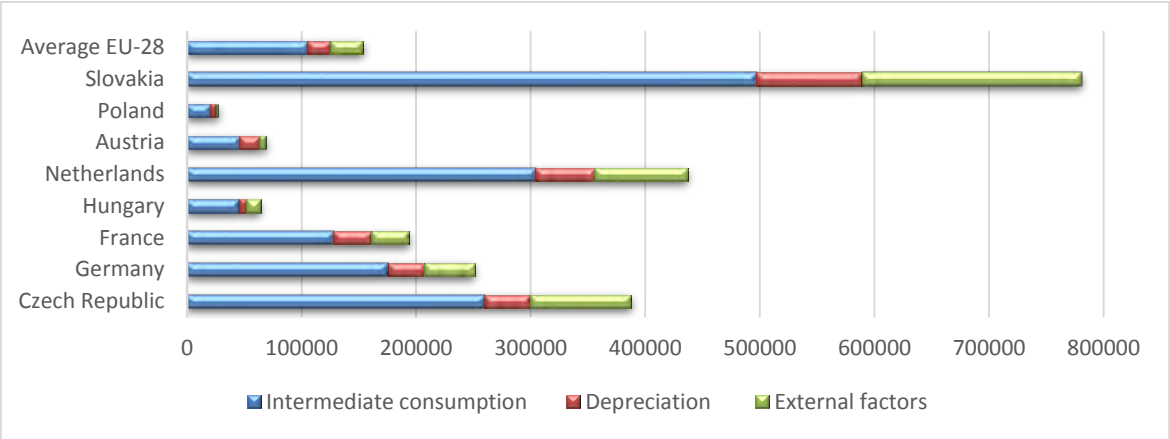
Chart 7: Intermediate Consumption, Depreciation and External Factors (Wages, Rent and Interest paid) per Farm in % (Slovakia 2009 – 2013)



Source: FADN database, calculation of authors

The external factors for the purposes of this text we consider wages, rent and interest. According to Varoščák, J. - Grznár, P. (2010) wages can be characterized as the total remuneration in cash or in kind paid by an employer to an employee for work performed by the employee during the period. It is also true that the wages of employees are defined as the gross prices and salaries and employers' social contributions.

Chart 8: Intermediate Consumption, Depreciation and External Factors (Wages, Rent and Interest paid) per Farm in € (Selected EU countries in 2013)



Source: FADN database, calculation of authors

Rent is characterized by Varoščák, J. - Grznár, P. (2010) as the amounts paid to the owner of non-material goods for their provision to another producer. The above-mentioned authors define interest charges as charges payable on a capital loan and are given from the nominal value of the financial asset.

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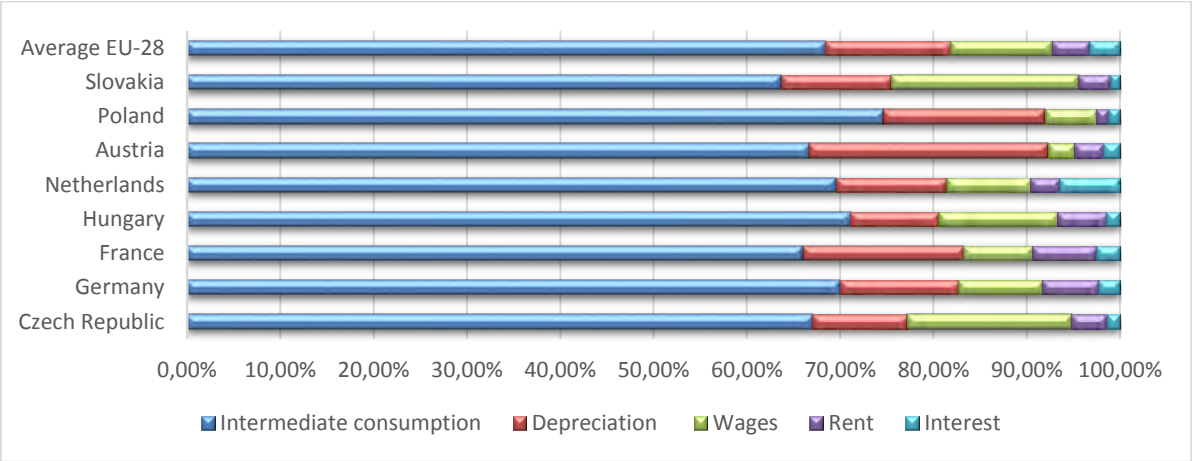
Chart 9: Intermediate Consumption, Depreciation and External Factors (Wages, Rent and Interest paid) per Farm in % (Selected EU countries in 2013)

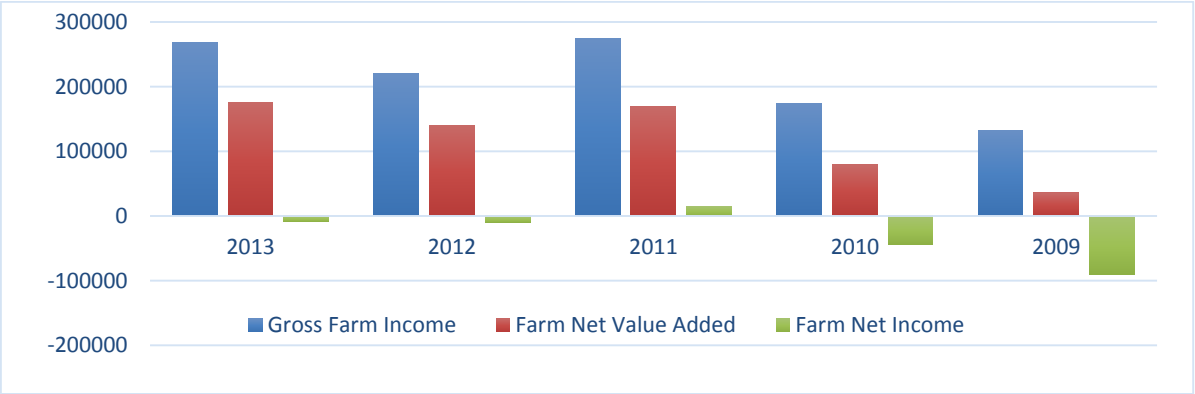


Source: FADN database, calculation of authors

3.3 Development of the Gross Farm Income, Farm Net Value Added and Net Farm Income

According to Varoščák, J. - Grznár, P. (2010) net income from agribusiness is a synergistic effect of the reproduction process of agriculture, i.e. of agricultural production activities, of employment in agriculture, of agricultural policy of the state and EU, of the proceeds of land and if financial capital.

Chart 10: Gross Farm Income, Farm Net Value Added and Farm Net Income in € (Slovakia 2009 – 2013)



Source: FADN database, calculation of authors

The added value is part of the value created by the production activities of producers. A special feature of the added value of agriculture is that the resulting value is reduced by taxes on products and increased by subsidies on products listed Varoščák, J. - Grznár, P. (2010).

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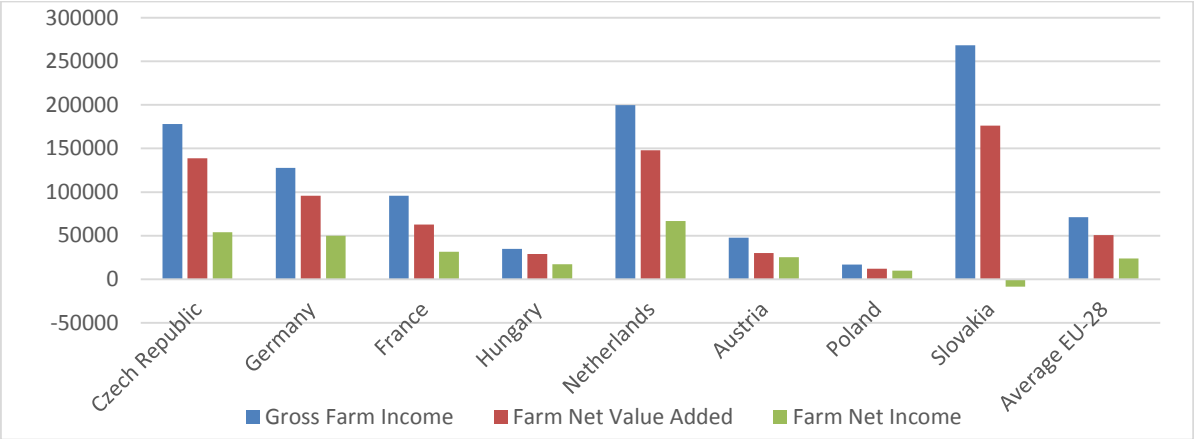
Chart 11: Gross Farm Income, Farm Net Value Added and Farm Net Income in € (Selected countries in 2013)



Source: FADN database, calculation of authors

4. Conclusion

The global economic and environmental crisis raises the demand for changes in the agriculture and food industry, not only in Europe. In general, factors that would support the vision of a world without hunger, malnutrition and poverty can be summarized as follows: to invest in agriculture, to encourage educated people, to support science and research, to promote the development of small and medium enterprises, to implement sustainable food systems that respect the environment and human health, to limit the generation of food waste, to promote healthy nutrition and social protection.

From the analysis of some selected indicators and their comparison of the Slovak agriculture and selected EU countries can assess the status and development (on the farm or per hectare of land) as follows:

- The average area of agricultural land on the farm in Slovakia is the highest within the EU.
- The intensity of the inputs and outputs (the total agricultural output, intermediate consumption per hectare of the land) is in Slovakia the lowest within the EU.
- Slovak agriculture in the indicator Farm net income is in negative value, as the only EU Member State.

In order to solve the problems of agriculture we propose the following:

- To pre-define the relationship between the public sector, local government, private and business sector.
- Eliminating the gap between scientific knowledge and political decisions a reality, in practice to implement the right to choose, create alternatives outside of super and hypermarkets and multinational companies (regional companies).
- Develop a system for evaluating cross-sector of agriculture.
- Develop a methodology for the valuation of non-production benefits (income) of agricultural land use.
- Public support for agriculture and the justification should be based on an objective assessment of social benefits to society of agriculture (public goods).

Acknowledgement

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The role of cooperative banks in increasing the banking penetration ratio of rural areas in Poland

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Abstract
The objective of the study is to assess the number of households in rural areas which use banking services offered by cooperative banks in Poland and to identify factors determining and differentiating the level of penetration ratio. Primary and secondary sources have been used to obtain the results. Empirical material has been evaluated using indicators of structure and non-parametric "Chi" square (χ^2) test. The results confirm the key role of cooperative banks in increasing banking services usage in rural areas in Poland. Almost 70% of residents of rural areas use banking services offered by cooperative banks. Studies have shown that the factors determining the level of banking services usage of residents of non-urbanized areas are: gender, level of education, professional status and financial situation. Apart from traditional channels of access to a bank account, residents of rural areas also use online banking services (50% of respondents) offered by cooperative banks.

Keywords: *cooperative bank, rate of usage of banking services, rural dwellers*

JEL Classification: *D12, G21, R22*

1. Introduction

The current account is a basic banking product. This type of account enables cash settlements, depositing savings and taking out a loan in the form of a debit. Current accounts offered by banks for individual customers differ significantly from those offered several years ago. The current account offers have been expanded and additional services like credit cards, automatic deposits, overnight deposits and insurance products have been added.

According to Eurobarometer 282 Report, nearly one in ten Poles does not have a personal bank account; moreover accounts of a part of the population remain inactive. The number of bank customers in Poland compared to other EU countries is low. The penetration ratio stands at 89%, ranking Poland 19th alongside the Czech Republic (Flash Eurobarometer 282, 2013). The lowest ratios are among the elderly (over 59 years) with a primary/secondary education level, low-skilled employees, the unemployed, and rural residents. The low ratio of banking services usage in Poland results from many factors: attachment of Poles to cash payments, negative demand with respect to financial institutions, as well as unequal access to bank branches, especially in rural areas (Beck, Demirguc-Kent and Martinez-Peria, 2007). Although the number of bank customers in non-urban areas in 2006-2009 increased significantly (from 38% in 1996 to 72% in 2009), Polish rural areas still have the lowest penetration ratio (Koźliński, 2009).

The objective of the study is to assess the number of households in rural areas which use banking services offered by cooperative banks, which in non-urbanized areas are often the only financial institutions within a radius of several kilometers, and to identify factors determining and differentiating the level of penetration ratio. The main reason for taking the issue into consideration was the importance of the subject in question. A high ratio of banking services usage among householders in addition to benefits to the individual customer also brings about

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economic benefits by increasing non-cash transactions, which, in turn, can reduce the costs resulting from money issuance and management, favors the development of banking services, reduces losses associated with cash crime as well as enhances convenience of settlement of transactions in economic and social activity (Wurgler, 2000).

2. Data and Methods

For the purposes of the objective, field research using personal interview technique was implemented (survey). The interview questionnaire contained several closed questions. Questions were divided into two groups: demographic questions and proper survey questions. The research was carried out in the Malopolskie Province. The study was conducted in 2015 on a group of 400 people residing in rural areas. Respondents were randomly selected. The sample size was determined according to the prospective specifity of cross classification analysis of tabular data (Bazarnik, Grabiński, Kąciak, Mynarski, and Sagan, 1992). After data reduction process, 382 questionnaires were selected for further analysis.

55% of respondents were female and 45% male. The study involved adults only (over 18 years). Almost 50% of respondents were aged 18 to 35 years, 35% o from 36 years to 55 years. The remaining respondents were over 55 years. The largest group of respondents had a secondary education (45%). 26% of all the respondents had a higher education. The remaining respondents declared a vocational education (23%) and a basic/lower secondary (6%). The high participation rate of respondents with higher education resulted from the fact that they were more willing to participate in the survey. The dominant group of respondents was employed (65%). Pensioners accounted for 19% of the study population. Farmers (9%) and college or university students (7%) participated in the survey as well.

The study of empirical material used indicators of structure and non-parametric test "Chi" square (χ^2) (survey).

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{s} \frac{(n_{ij} - np_{ij})^2}{np_{ij}} \qquad (1)$$

where,
n - sample size, r - the number of quality characteristics X, s - the number of quality characteristics Y, p_{ij} - hypothetical probability , n_{ij} - the number of sample elements having the *i*-th number of quality characteristics X and *j*-th number of quality characteristics Y.

The null hypothesis H_0 was formulated thereby assuming the independence of the studied characteristics. If an inequality $\chi_e^2 \geq \chi_\alpha^2$ was observed after carrying out the test, the H_0 hypothesis, assuming independence, was rejected in favor of the H_1 hypothesis which assumed the dependence of the characteristics considered. All null hypotheses were verified at a significance level of p=0,05. In addition to primary sources, secondary sources such as: trade literature and reports of the National Bank of Poland were employed in the analysis. The results of the analysis are presented in a descriptive and graphical form.

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3. The nature of cooperative banks' activity in Poland

The shape of the financial infrastructure and agriculture in rural areas in Poland, including banking services, is a consequence of specific historical and political circumstances as well as the tendency of the banks themselves to initiate and carry out activities in this area (Kata, 2011). The cooperative banking sector plays the key role in supplying financial services in Poland's rural areas.

By the end of 2014 there were 565 cooperative banks in Poland, which except for one were associated in two bank associations. Although the sector has the largest network of bank branches in the country (1/3 of all branches), the share of these entities in the Polish banking system is relatively small, less than 7% of banking sector assets (Table 1).

Table 1: Basic information about the cooperative banking sector in Poland in 2010-2014

Specification	2010	2011	2012	2013	2014
The number of cooperative banks in Poland (items)	576	574	572	571	565
Share of cooperative banks in the banking sector assets (%)	6.1	6.1	6.4	6.9	6.9
Interest income of cooperative banks (% profit on banking operations)	72.4	75.0	77.1	75.3	75.9
Operating expenses (% of net banking income)	65.0	63.0	62.6	67.4	65.2
Gross profit (% of basic average funds)	15.1	16.2	15.7	10.8	10.8
Net financial result (% of basic average funds)	11.8	12.7	12.2	8.4	8.3

Source: *Rozwój systemu finansowego w Polsce w 2014 r.* (2015), p. 122-125.

Cooperative banks in Poland constitute a diverse group of stakeholders, both in terms of size, main areas of activity and achieved profitability. The Minimum Capital Requirement for cooperative banks should be the equivalent of EUR 1 million. Such banks are allowed to operate only in their own district and province. These types of banks comprise the largest group of cooperative banks in Poland. Banks with capital higher than the equivalent of EUR 5 million may operate throughout the entire country. At the end of 2014, 123 cooperative banks, whose capital exceeded that amount, operated in Poland.

The structure of cooperative banks' assets is different from commercial banks. Maintaining significant investments in affiliated banks resulted in the bank debt of cooperative banks to the financial sector. The figures were three times higher than the average in the banking system. The structure of financing cooperative banks is different from the structure of financing commercial banks. The assets of cooperative banks come mostly from deposits of households rather than companies. A characteristic feature of cooperative banks' activity in Poland is a high proportion of liabilities to the local government sector institutions. This is due to the fact that smaller municipalities maintain bank accounts almost exclusively in cooperative banks.

The structure of cooperative banks' activities shows that these banks are mainly focused on providing traditional banking products. In 2014, net interest income accounted for over 75% banking income, and the dominant part of the non-interest income came from commissions and fees. The high proportion of operating expenses of cooperative banks shows their relatively low efficiency (C/I ratio at the end of 2014 amounted to 70%). It results from limited opportunities

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to conduct economies of scale and the fact that the level of ICT development is lower than in commercial banks (Rozwój systemu finansowego w Polsce w 2014, 2015).

4. Factors determining the usage of banking services offered by cooperative banks by rural areas' residents

Over the last 10 years the number of bank customers in Poland has been growing steadily. Although the fastest growth has been observed in rural areas, they still have the lowest penetration ratio (72%) (Koźliński, 2009). The undertaken study shows that the ratio of usage of banking services offered by cooperative banks in rural areas in Poland amounts almost to 70%. Comparing the overall number of banking services users in rural areas of Poland with the rate for cooperative banks, it can be stated that the vast majority of residents of non-urbanized areas use mainly the services offered by cooperative banks (the difference by 2 percentage points). The factors determining the choice of a cooperative bank were: gender, education level, the main source of income and financial situation of the respondents. The services offered by a cooperative bank are used mostly by women with higher education who declare their financial situation as good and by farm holders (Table 2).

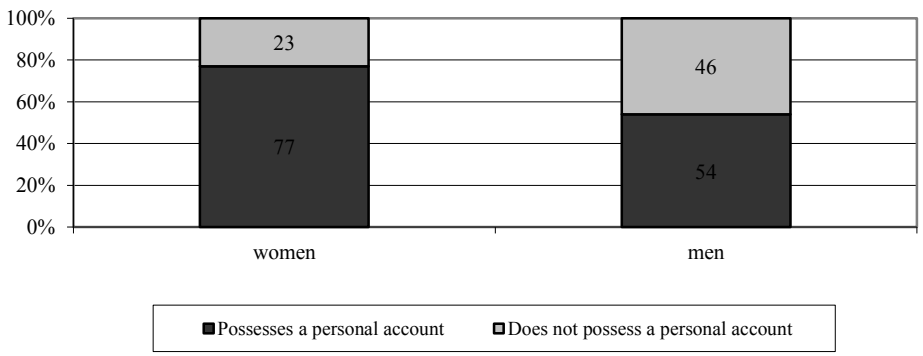
Table 2: Factors determining the usage of banking services by rural areas' residents (the results of the test of independence χ^2, p=0.05)

Specification	The value of the test
Gender	χ^2=21,06; df=1
Education	χ^2=26,94; df=3
Financial situation	χ^2=15,48; df=4
The main source of income	χ^2=10,58; df=3
Age	χ^2=6,03; df=3 (negative test)

Source: own research

The analysis shows (Figure 1) that women living in rural areas who use banking services, more often than men have an account in a cooperative bank. These results are consistent with previously conducted studies (Szafrańska, 2010), which show that banking services usage rate is higher for men who also more often than women have a current account in a commercial bank.

Figure 1: The rate of usage of banking services offered by cooperative banks according to gender (customers of cooperative banks)



Source: own research, n=382

The next determinant for the usage of banking services rate is the level of education. This factor is of particular importance in the financial services market, because the majority of services require extensive knowledge. Consumers with higher education are able to determine the

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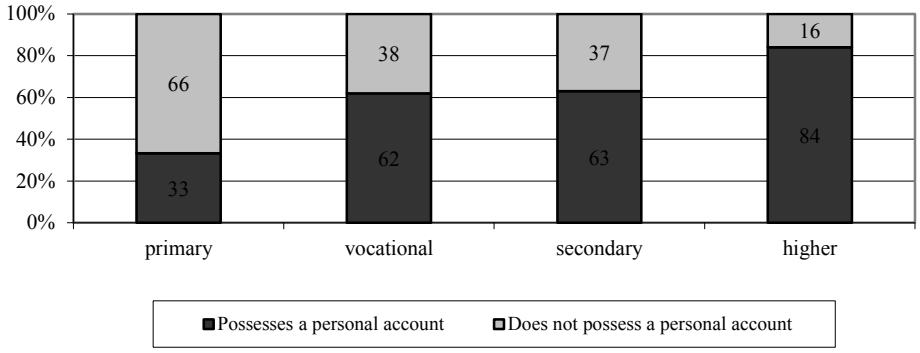
benefits of using an individual account. According to Figure 2, with the increase of the _level of education, the rate of people who have an account in a cooperative bank grows. The rate of banking services users increases from 33% in the group of respondents with primary/secondary education to 84% in the group of respondents with higher education. Such correlation is also confirmed by the results of research conducted by the Central Bank of Poland (Koźliński, 2009).

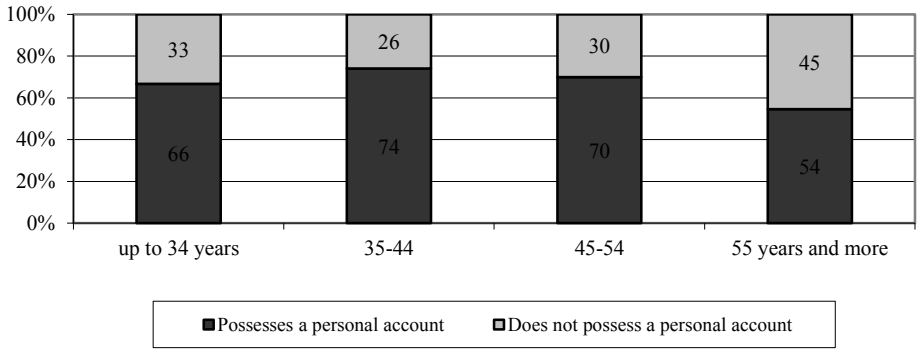
Figure 2: The rate of usage of banking services according to education (customers of cooperative banks)



Source: own research, n=382

In the investigated sample, respondents who do not have an account are usually those with primary and secondary education (66%). Mostly they were the oldest respondents. On the other hand, the highest rate of usage of banking services offered by cooperative banks was for respondents aged 35-54 years. However, as shown by statistical analysis (Table 2), the age of consumers is not a determining factor in the use of services offered by cooperative banks by rural area residents. In this case, the test of independence χ^2 was negative. A detailed distribution of respondents is presented in Figure 3. The results are consistent with the results of tests carried out by other authors.

Figure 3: The rate of usage of banking services according to age (customers of cooperative banks)



Source: own research, n=382

According to Figure 4, possessing a bank account in a cooperative bank is also dependent on the main source of income in the household. Farm holders constitute a group that most often have a bank account in a cooperative bank. The rate of banking services users is the lowest for pensioners (55%). This is due to their attachment to cash payments.

Figure 4: The rate of usage of banking services according to the main source of income (customers of cooperative banks)

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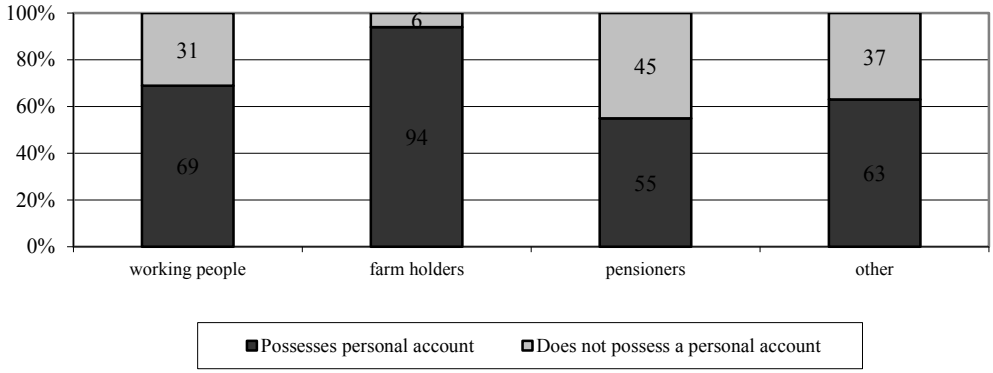

Source: own research, n=382

The services of a cooperative bank as the main financial institution are mostly used by respondents assessing their financial situation as good (80% of respondents from this group have an account in a cooperative bank). 60% of remaining respondents were interested in using cooperative banks.

Apart from traditional access to a bank account one in two respondents used internet banking services (i.e. 2/3 of rural residents using banking services). The statistical analysis indicates (Table 3) that the factors determining the use of internet banking services by rural resident are: age, education level, financial situation and the main source of income of respondents. The internet banking services are used mostly by respondents up to 44 years of age. Almost 65% of respondents from this age group had internet access to their account, while only one in five consumers uses this service in other age groups.

Table 3: Factors determining the rate of banking services usage by rural residents (the results of the test of independence χ^2, p=0.05)

Specification	The value of the test
Age	χ^2=61,20; *df*=3
Education	χ^2=60,10; *df*=3
Financial situation	χ^2=34,9; *df*=4
The main source of income	χ^2=48,06; *df*=3
Gender	χ^2=3,46; *df*=1 (negative test)

Source: own research

Another factor determining the use of internet banking services is education level. According to the survey, the higher the level of education, the more respondents use electronic banking. In the group of respondents with higher education, almost 80% opted for this service, while in the group with the lowest education, the rate did not exceed 10%. This correlation is also observed regarding commercial banks and credit unions.

Taking the main source of income into account, groups that usually use e-banking were farmers (87.5%) and employed persons (51.1%), as these two groups of people are the main customers of the cooperative banks. While taking the financial situation of the respondents into account, most respondents assessed their situation as good or average. A factor not influencing the use of internet banking amongst rural population is gender. Women and men equally benefit from this service in cooperative banks.

5. Conclusion

The results of the study confirm the key role of cooperative banks in increasing banking services usage by residents of rural areas in Poland. The rate of usage of banking services offered by cooperative banks by rural residents is lower by only a few percentage points than the overall

rate of banking services usage in rural areas in Poland. This ranking results from the local nature of the activity. Studies have shown that the factors determining the level of banking services usage of residents of non-urbanized areas are: gender, level of education, professional status and financial situation. A factor which does not influence the financial behavior of customers of cooperative banks is age. Apart from traditional channels of access to a bank account, residents of rural areas also use online banking services (50% of respondents). The factors shaping these attitudes are: age, education, professional status and financial situation of clients. A lower level of access to the Internet than in urban areas, a lack of computer skills among the elderly and less educated, and the high operating costs of the internet, resulted in the fact that older and less educated customers are less likely to use online banking in cooperative banks.

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SESSION 6

Accounting and information systems

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Some amended provisions of the Slovak income tax act

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Abstract
The income taxes belong to the most important direct taxes and form consistent and significant part of the state budget income. The Act no. 595/2003 Coll. on Income Tax as amended (hereinafter "Income Tax Act") includes provisions related to taxation of individuals and corporate entities. By the Act no. 253/2015 from 22 September 2015 (hereinafter "Amendment") the Slovak Income Tax Act has been amended and changed. From the Amendment the most important changes are selected, focusing on those, which may have an impact on the taxpayers who will file the income tax return after 31 December 2015, i.e. the provisions which will have an impact on the taxation period ending on 31 October 2015 and later. Further, the Amendment introduces other changes that are effective as of 1 January 2016. The results, based on the selection and the analyses, shows that the amended provisions of the Income Tax Act have significant impact on taxation of both, i.e. individuals and corporate entities and includes many changes, specifications and adjustments.

Keywords: *corporate entity, income tax, individual, taxpayer*

JEL Classification: *D31, D39, H20, H25*

1. Introduction

"In this world nothing can be said to be certain, except death and taxes", said Benjamin Franklin in 1789. A rather sardonic proverb, but still very true. It draws on the actual inevitability of death to highlight the difficulty in avoiding the burden of taxes. It means that we cannot divert the inevitability of paying taxes, nor may we take their amount for granted, as we may might have observed in the latest changes of tax legislation (Nováková, 2013).

The tax is defined as obligatory payment to the state budget and the obligation of payment of taxes is determined by the law (Harumová & Kubátová, 2006).

Creation and development of a favourable business environment in regions is unthinkable without an appropriate tax system. Creating a tax system, each country has to consider not only the increased revenue collection from taxpayers, but it also has to be able to develop the business environment and to promote the people's prosperity by reducing differences in the regional development (Puzule, 2015).

The income taxes are the most important taxes in the last taxation periods which are considered as not irrelevant, in different countries, as it is a significant part of the state budget income (Vančurová & Láchová, 2014). The comparative yield of income tax has been decreased in the last periods, which was caused not only by political motivated changes of its structure, but also implications of financial crisis.

Slovakia within European Union belongs to countries with the lowest tax burden, which reached the value 28.8% of GDP in 2011, together with Romania, Bulgaria, Latvia and Lithuania in the European Union (Váryová, Košovská & Ferenczi Vaňová, 2013).

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Changes of provisions of Income Tax Act have impact on the tax base of the entrepreneurs by means of tax not deductible expenses (Ferenczi Vaňová, Krajčírová, Váryová & Košovská, 2015).

Taxes belongs to indirect economic tolls of business (Schultzová, A. et al., 2011). Tax burden expresses the extension in which the tax system, respectively the tax, based on the applied economic and tax policies drawn financial sources from the tax subject'revenues.

Following the analysis provided by Machova and Kotlan (2015) they confirm the hypothesis, showing that if productive spending is financed by indirect taxes, the effect on economic growth is positive, while if the spending is financed by direct taxes, the effect on growth is negative.

2. Data and Methods

The present article is focused primarily on the analysis of the current tax legislation on income taxes and new amendment of Income Tax Act effective as of 1 January 2016. We would like to bring an overview of the most important changes in the field of the income tax. Standard methods of a scientific work such as selection, analysis and synthesis are applied in the article. The basic theoretical view on the issues focused mainly on the legal norms related to income taxes, i.e. the Act no. 595/2003 Coll. on Income Tax as amended (hereinafter "Income Tax Act") and the amendment no. 253/2015 Coll. to the Income Tax Act were taken into consideration. Given the subject of the analysis, the explanatory memorandum to the no. 253/2015 Coll. to the Income Tax Act is also used.

The amendment no. 253/2015 Coll. to the Income Tax Act from 22 September 2015 has been published in the Collection of the Laws of the Slovak Republic on 19 October 2015. The Amendment includes many changes and adjustments related to taxation of individuals and corporate entities. In particular, some changes relates to taxation of individuals aimed in an increase of capital investment and trading with securities in a financial market. Some specifications are connected with the amendment and change of other laws and regulations of the Slovak Republic, i.e. Act no. 431/2002 Coll. on Accounting as amended. Some provisions of the Amendment are defined more precisely and implement the regulations of the European Union, i.e. in payment of profit share (dividends). Further, some amendments should make the fight against the tax evasion more effective and the financial discipline of the taxpayers should be also improved.

The most important changes are selected, focusing on (i) those, which may have an impact on the taxpayers which file the income tax return after 31 December 2015 and (ii) other changes which Amendment introduces from 1 January 2016.

3. Results and Discussion

3.1 New provisions of the amendment applicable to the income tax returns filed by taxpayers after 31 December 2015

New provisions of the Amendment are applicable to the income tax returns filed after 31 December 2015. This means that those provisions also apply to the 2015 taxation period. From the Amendment the most important provisions relates to the tax deductibility of expenses for taxpayers. The Amendment provides more proper definition of the general tax deductibility of expenses by way that it is necessary, that such expenses are incurred to generate, assure and maintain taxable income. In general, in accordance with the Income Tax Act effective until 31 December 2015, tax-deductible items are those that the taxpayer

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incurs to generate, ensure and maintain his income recorded in the accounting books/or in the accounting evidence of the taxpayer. Following the Amendment, the word "taxable" is added to this general definition. This means, that according to the Amendment, the tax deductible expenses are considered as expenses that are incurred to generate, assure and maintain taxable income of the taxpayer. Further, the Amendment specifies and changes the tax deductibility of certain expenses and some of them are summarized below in this paper.

Expenses on advisory and legal services

The Amendment to the Income Tax Act explains the term "expenses spent on advisory and legal services", which are only tax deductible by the taxpayer upon payment starting from the year 2015. The Amendment in more detail specify that only expenses spent on advisory and legal services defined in the Statistical Classification of Products under the code 69.2 (accounting services, bookkeeping, audit and tax advisory services) and under the code 69.1 (advisory services, representation in various proceedings as well as notarial services) are to be treated as tax deductible expenses. This means that only expenses on advisory and legal services defined under the code CPA 69.1 and 69.2. are to be treated as tax deductible after their payment only.

Expenses for obtaining of norms and certificates

In general, according to the current Income Tax Act, expenses spent for obtaining of norms and certificates not exceeding acquisition value of EUR 2,400 are to be included in the tax base provided that will be paid equally during the period of their validity, however not more than during 36 months. The Amendment specifies that expenses spent on standards and certificates with the acquisition price lower than EUR 2,400 shall not be deferred, however, they will be included to tax base at once.

Accessories to receivable

Creation of bad debts provision against to accessories to receivable is to be treated as tax deductible provided that the accessories have been included to the taxable income of the taxpayer and from the due date of receivable, to which accessories relate, the period of more than 1 080 days elapses.

The write off of accessories are to be considered as tax deductible expense provided that the creation of bad debt provision against to these accessories would be considered as tax deductible expense (accessories were included into taxpayer's taxable income and from the due date of receivable, to which accessories relate, the period of more than 1 080 days elapses).

In case of cession of receivable including their accessories, the tax deductible is to be the amount of accessories included into the taxable income of the taxpayer up to the amount of income incurred from the assignment.

Provisions related to taxpayers in restructuring or bankruptcy proceeding

A taxpayer, in case of which the court accepted the restructuring plan, decreases the tax base in the tax period, in which the plan was accepted, by the amount of liabilities by which the tax base was increased in previous tax periods in compliance with the Income Tax Act. This procedure is to be applied also in case of taxpayer in the bankruptcy proceeding. The taxpayer decreases the tax base in the tax period which ends as at day preceding the day of effectiveness of declaration for bankruptcy proceeding.

Tax depreciation charges of some assets sold

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In the case of the asset sold during a tax period, at which the tax deductibility of the residual value is limited (i.e. cars), according to the Amendment, the taxpayer is to be able to apply the tax depreciation charges in the amount of corresponding to the number of the whole months, during which the assets were booked or recorded by the taxpayer.

Input value of financial assets

In respect of input value of financial assets the new provision is to be implemented into the Income Tax Act based on the Amendment. This change also relates to provisions, which deal with claiming of tax deductible costs in case of the sale of shares, and other securities. It is specified that in case of sale of such assets as tax deductible expense will be considered:

i. acquisition value (if financial asset was acquired by purchase),
ii. price stated by expert opinion (if financial asset was acquired free of charge),
iii. acknowledged value of in-kind contribution,
iv. fair value (if financial asset was acquired in terms of business combinations applying fair values),
v. original value (e.g. financial asset acquired by in-kind contribution with application of original values),
vi. value of paid monetary contribution.

The use of share of taxes

According to the Amendment the usage of a share of taxes paid by legal entity represents a decrease from 1.5% to 1.0%. If a taxpayer, which is a legal entity, has not provided financial gift at least in the amount of 0.5% of the tax paid in the tax period or does not provide such financial gifs by the deadline for filing of income tax return, will be entitled to assign the share of the paid tax to beneficiaries specified by him up to 1.0% of the paid tax. This provision must be applied for assignment of percentage of tax paid after 31 December 2015.

3.2 Other changes which the amendment introduces from 1 January 2016

Following our analysis, the Amendment introduces provisions that mostly relate to taxation of individuals and might support and increase the capital market investment. Capital income of individual is to be taxed within the separate tax base individually by unified rate in the amount of 19% regardless whether this income will flow from outside the Slovak Republic or from the sources in the Slovak Republic. Further, the Amendment introduces the personal income tax exemption representing the social allowances provided from the social fund in case of death of close relatives, reducing of results of natural disasters etc. paid in by one employer in the total amount not exceeding EUR 2,000.

Personal income from the sale of the securities accepted for trading on the regulated market is to be further exempt from the personal income tax in case if the period between their acquisition and sale exceeds one year provided that these securities were included in the business assets of taxpayer. Personal income from the sale of securities, sale of options and derivatives is to be exempt from personal income tax provided that this income is generated within the long-term investment according to the special regulation including income which is paid after 15 years from the beginning of saving. This tax benefit should be applicable to the income which is related to the transfer of securities obtained in the course of the saving period.

Further, according to the Amendment, the personal income received in accordance with the Copyright Act will be subject to the withholding tax at rate of 19% regardless of the fact whether this income represents income from articles to the newspapers and magazines or income from lecture activities or artistic performance. However, if the taxpayer (e.g. artist) concludes the agreement with the payer of tax (user) that

the withholding tax will not be applied, the taxpayer (e.g. artist) will transfer the tax itself. In case of the income from the issue, propagation and extension of literary works and other works and in case of industrial licences the withholding tax will not be applied.
Within the dividends taxation the amended Council Directive 2011/96/EU (hereinafter "Parent-Subsidiary Directive") is to be implemented into the Income Tax Act with the aim to make more effective the fight against to tax evasion. The Amendment introduces a new condition when the profit share (dividend) shall not be subject to tax (at corporate entity) only up to the amount as is not tax deductible at the taxpayer paying the profit share. This means that if the profit share (dividends) will be considered as tax deductible expense of taxpayer paying this profit share, this corresponding amount will be in the Slovak Republic included into the tax base of taxpayer receiving profit share, i.e. such income will be taxable.

4. Conclusion

The amendment no. 253/2015 Coll. to Act No. 595/2003 Coll. on Income Tax as amended has been published in the Collection of the Laws of the Slovak Republic on 19 October 2015. The Amendment includes many changes, specifications and adjustments related to taxation of individuals and corporate entities. The most important changes are selected, focusing on (i) those, which may have an impact on the taxpayers which file the income tax return after 31 December 2015 and (ii) other changes which Amendment introduces from 1 January 2016. In our view, provisions that were overviewed in this paper clearly specified and determined the tax deductibility of some selected expenses, therefore, we are of the opinion, those will be generally accepted in practice. Further, some changes have major impact on financial investment and will mostly affect taxation of individuals.

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Accounting information systems in business management

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Abstract
Enterprise information system is database of information for management and decision making by managers. Integral part of information system is the subsystem which focus on the recording and processing of accounting documents. The importance of accounting, as an important tool for corporate management, continues to grow. In the paper, we present using the accounting system of the company, as a source of objective and relevant information. Information from accounting provides managers with an overview of past and current situation of the company and it is also supporting data for predicting development, tool for decision making and control. Software selection is important for provide information in the required scope and quality. For choosing accounting system, company decides how much information the system will contain and establishes the extent of its use. A question of selection of accounting system then linked with the management and directly affects the quality and speed of decision in the company. Subject to review is information system in selected companies. We applied the basic scientific methods of research. Based on obtained results, we concluded that an essential prerequisite for ensuring reliable and sufficient information is high quality accounting system. Another prerequisite is the relevance of using accounting information by managers.

Keywords: *accounting, company, information system, management, managers*

JEL Classification: *C88, M15, M41*

1. Introduction

Currently, the companies have sufficient working capital, in many cases they have adequate supply of labor. Across the board, it cannot be said that all companies are based on the same comfortable base (for example, there are differences in financial background). All companies can affect accounting software they choose and how they use it. In order to be competitive company, it must have high quality information system providing solutions which not only ensure the recording and processing of data in real time, but will also serve as a support achieve company's objectives (Stuchlý, 2015). Conditions are naturally create for a flexible implementation of the latest technological elements, in the information and communication infrastructure, in a liberalized environment (Hennyeyová, 2007). It is necessary, that the information system supports also planning and forecasting of production and takes account on specifics of customers. Implementing high quality (appropriate) information system improves the management process and keeps competitiveness on domestic and foreign markets.
The ways of getting information are constantly expanding. The technical development also improves the access options to data. In 70´s and 80´s of the 20th century, there was solved an issue with capturing the majority of the company activities data. At the beginning of the 21st century, the archiving issue of large amount of data was subsequently solved. However, even large amount of archived data in company's information system do not guarantee to provide all

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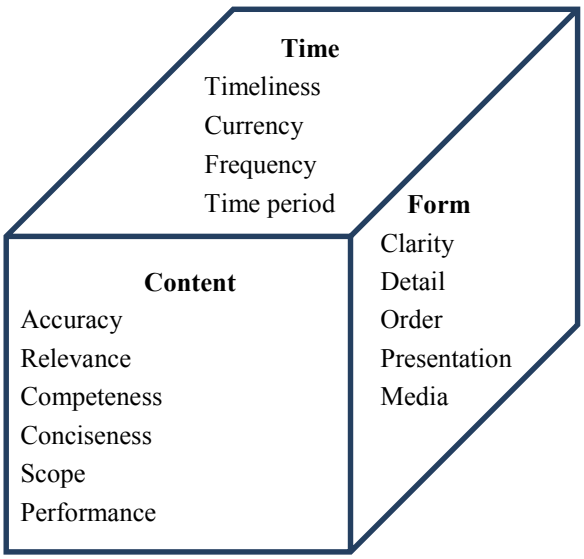
necessary information needs to managers. This work is about the scope quality of the information provided, the access speed, availability, size and possibilities for their further.

Picture 1: A summary of the attributes of information quality



Source: O´Brien, J. A., & Marakas, G. M. (2011). *Management Information Systems*

The subsystem provides the necessary information needed for decision making and approving additional actions is accounting, and involves all three areas of accounting:

a) the financial accounting system provides holistic information for the company,

b) the internal accounting system elaborates in details on selected financial indicators at lower levels. It provides insights for internal needs of company.

c) the managerial accounting is the higher level of internal accounting system, which processes data from intra-organizational accounts, in various statements, and managers make decisions on their basis.

The company acquires precise information from a combination of financial and managerial accounting. A company accounting software is a base to gather information. Therefore, it is essential to choose the appropriate accounting system. For the right decision, especially for middle and top management level, is essential managerial accounting, because it works with operating costs, revenue items and cash flows. It is an extension of financial accounting.

An assumption for successful decision making and management is a functional system planning of economic indicators. The plan is based on results of historical periods (financial accounting, managerial accounting) and sets future goals, including external factors affecting the company.

Obtaining this information in conditions of turbulent economic environment requires its own, unique, nonstandard data processing within the managerial accounting and management information systems (Caputa, Škorecová, 2015).

2. Data and Methods

In the present paper, we deal with issues about information support managers. Objects of investigation are the corporate information systems in companies. Selected companies are large manufacturing companies, that did not wish to disclose their name, therefore are mentioned as a company A and a company B in this paper. We describe in surveyed entities the current situation of accounting software. One of the areas of the research is focused on the scope and

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accuracy of information available in the accounting software. The other area of the research shows how managers access to information, their attitude to provided information and its relevance to other business decisions. The aim is to put forward proposals how to improve the existing information system, so that they fulfilled the requirements of managers on the required information for all levels of management. We use basic methods: analysis, synthesis, comparison, deduction, controlled interviews with managers in selected companies and in software companies. The underlying data are from research in selected companies, from the analysis of selected software products and from comparison of the software available in the market (software CHEMAT from the company CHEMAT Computer Service Ltd., software Construction Monitoring from the company Kros, a.s., software GARIS from the company TatraSoft Group Ltd. and software MAGIC from the company Sango Ltd.; SAP Business One from the company Softip a.s.; POHODA Business Intelligence from the company Stormware, s.r.o.). Because of the large scale of the problem, we present concrete results obtained from investigated companies, in the present paper. We formulated conclusions after evaluating results and a consultation with managers of selected companies and software companies.

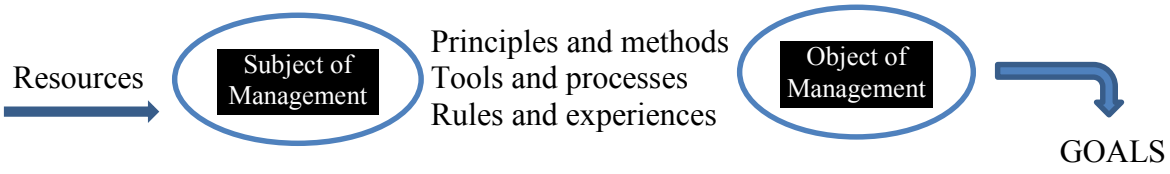
3. Results and Discussion

3.1 Accounting system as a part of company management

Accounting information system summarizes financial data about company and organizes data into effective reports. Accountants present results to managers that provide decision-making based on these reports.

A decision – making is the main managerial activity. It is one of the basic responsibilities of a manager on every level. Management can be defined as a set of activities (including planning and decision making, organizing, leading, and controlling) directed at an organization's resources (human, financial, physical, and information), with the aim of achieving organizational goals in an efficient and effective manner (Griffin, 2013). Management is a gradual, systematic decision-making towards achieving the objectives. Process of decision-making is closely related to management. The manager must make decisions every day, no matter which management activities (functions) are currently being executed. The manager uses decisions in planning, organizing, human resources, management and control. Mižičková, Simon and Ubrežiová (2005) define management as open system of knowledge about the specific activities of managers who operate in order to establish a fulfillment of the objectives in the organization, business entity. Management belongs to the most important human activities. It is a process which is executed by managers and it is used to achieve company goals through the transformation of inputs to the required output. The main mission of managers is to ensure the most efficient transformation of inputs by using these processes. Company accounting system is one of the managerial tools to achieve required outputs and goals.

Picture 2: Management as a process



Source: Míka, V. T. (2006). Management methods and techniques.

Larger companies have increased demands on their accounting information systems. Today, many organizations use information systems that integrate financial and non-financial information about business activities and about their business partners in one database. The

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accounting subsystem is the integrating element of corporate information (Kučera, Látečková, 2008). Book-keeping records are an important source of accounting information in each field of corporate activity. Essential to management and decision making is access to objective and accurate information. Ideally, all information should be accessible in real time to meet managers requirements. The information system should contain specific technologies that will allow for not only the storage of large amounts of data but also timely processing, and providing outputs for managers in a required format.

The manager should be able to get an immediate overview of the important economic indicators, as well as the possibility of remote access (Cloud Computing) to accounting systems, can then present information in real time and secure their availability anywhere with an internet connection. Of course there should be the veracity and reliability of accounting data, which ensures relevant results of financial and economic analysis.
The research was based in companies where the accounting systems were already implemented. Their selection was made on the basis of market research and based on the specific needs of managers – according to their experiences and requirements that the accounting system put.

3.2 The analysis of the accounting system researched companies

Based on the research we carried out investigations of the company to be divided into two categories. The first category consists of companies that have already implemented accounting software for a long time ago and as an extension they have specialized software for management and economic analysis.

The second category are those companies that have chosen new application software directly involving accounting, analysis options and reporting modular way.

In all companies, managers agreed that the accounting information are essential for the proper management and decision making. We also found there are certain deficiencies and problems in every company, that need to be resolved to establish a quality information base for corporate governance. In the next part of the article we present results of the practical application of research in two selected companies. Concrete proposals from this research can be subject for dealing with similar situations in other companies.

The first company used accounting software Chemat connected with specialized software CM (Construction Monitoring). In the beginning, the company started using the accounting software which was later connected with managing building construction. System implementation, interaction, data definition and information streams from one platform to another was not simple. From the software construction monitoring data flow to Chemat as an invoicing framework and from the accounting software data streams back to CM, where information is reconciled and analysed. CM contains the projected results and therefore it is the core of the accounting and controlling.

Input data are decentralized and processed in Chemat by the individual departments. An employee inputs contract specific data to the department and also verifies it. Then, a senior manager approves the input. Outputs from CM have a predefined format. This information is used by managers to make a decision. Managers, depending on the current issue, the level of competency and their responsibility, will then make a decision.

According to the managers statements, the benefits of information system are:

- reducing time period between request and provision of data,
- system transparency,

- variability of output reports, usefulness of provided information and options of their presentation,
- option to adapt the system to individual manager requirements,
- possibility to edit the system according to market conditions,
- improving production control.

The company covers needs of all necessary controlling information by integrating both software systems. The CM system contains predefined output formats by which it is possible to extract for certain period of time.

Managers positively evaluated the possibility of calculating the economic indicators, compiling reports on the evolution of costs, revenues and economic analysis company. For this area is the most important accounting subsystem that provides relevant information - view the assets, financial and income situation of the company. Another important application area for controlling process is a comparison plan with reality, reasoning divergences between planned and reached results and looking for effective measures to the next season. The information system including accounting software and construction monitoring software currently covers all needs of company. Users can define personalized outputs required for their operation area because that both softwares are modular. Advantage of the software is, that output which does not have predefined formats, is able to export to Excel and work with numbers in pivot tables.

The question of security systems seems resolved issue, because the access of individual staff members is individually adjusted according to the classification of the worker. However, since the approaches adjusted to workers is the possibility of human error poorly set up access for employees. Then, if someone allows access throw all the subsystems, may also occur for misuse of the information or to the change data (either intentionally or unintentionally).

Based on the above, we accept the conclusion in this researched company, that the system covers all needs and allows more opportunities of development given the growing requirements that may arise over time. Managers identified as problematic issue about data security. Therefore we propose to introduce "Information Security Management System", which serves to protect the availability, confidentiality and integrity of data in order to prevent their misuse and change.

Our other recommendations are as follows:

- connecting attendance with subsystem wages,
- introduction of the prepared module approval outgoing orders electronically in CHEMAT,
- better use of existing modules - as a contract, a loan,
- data from the subsystem Accounting could be used to calculate other financial-economic indicators. Spider analysis has been proposed as an option. Information obtained in the analysis could be a useful tool for planning, decision making and management. Clear presentation of each of the indicators helps to quickly identify in which areas the company is achieving better and which worse results. Spider analysis is the appropriate option for quality presentation of information on the financial situation of the company.

The second company used accounting software GARIS connected with software Magic (manufacturing processes). Like the company A, introducing of the system, interlinking and communication between both systems were not easy. Managers expressed satisfaction with the information system at present. The biggest positives of the information system are as follows:

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- understand user preferences, system interconnection between subsystems,
- system provides sufficient details,
- automated order processing, which allowed to reduce the number of employees in sales department,
- better access to information at every stage of the production process,
- monitoring the success of the product market, identifying non-profit goods,
- improve the processes related to production planning,
- reduce production costs,
- more flexible pricing, flexible response to market changes,
- total saving time by improving the efficient management at various levels of organizational structure.

Communication with the Finance Director of researched company brought findings, that the current system clarify information about flows and processes in the company. All subsystems are interconnected and managers have greater insight about what is happening in every department. Implementation of the current solution decreased operating costs, as well as consumption of material inventories and expenses in administration. Managers obtain the necessary information quickly and easily, directly from the information system. Despite the above mentioned positives, we have also identified some negative aspects. In the view of Finance Director, it is necessary to fill out the decision-making process. The company will need to add into the information system a module ensuring a more sophisticated selection and presentation of information. A module which is enable to make an economic and financial analysis, to plan a financial position, to make a business strategy and development alternatives, to show strengths and weaknesses.

This company has implemented a quality information system, but managers are interested in the improvement the area of management and decision-making. We propose an extension software for summary reports according to requirements defined by managers. A new modul should allow plan, evaluate and manage financial and production activities in the company. Till a new module will be establish, we propose use data from the accounting subsystem in the form of output reports, an export to Excel for the purposes of calculating financial-economic indicators. As well for the company B we proposed a Spider analysis.

3.3 Evaluation of results

Based on the researched in selected companies, we found several assumptions that must necessarily be met to allow a company to build a quality and useable information database. The information database of the company is affected by its localization, the internet access, digital literacy employees and the technical equipment. A quality technical equipment is an assumption for providing information to support managers and their decision-making.

Introduce or enhance corporate information system, including the accounting system, according to the individual specifics, it is not financially simple matter. However, the analyzed company evaluated various options and concluded that the compensation quality of the information system by increasing the number of workers is risky, shorter, prone to errors and considerably more expensive solutions.

Based on the analysis conducted and the generalization of the results we conclude that to improve information support in any business, you must provide:

- the availability of data in real time - for immediate output option is necessary to continuously providing input into the system, the first step in this chain is incoming correspondence and its distribution to employees,

- data processing with short response time - from the time a document incomes to the company, its control and processing within an internal hierarchy, work in progress to a system,
- modification and open information system - editing options in terms defined needs of managers and possibly other levels of staff working with a system,
- optional remote access to data (cloud computing) - ensuring the fulfillment of the first condition and there are the availability of data in real time,
- full support for prepare development plan, for execution control, for business management, for continuous communication in the company - processing of various forms of inputs and outputs, usable for multiple purposes of business areas: production, economics, controlling.

4. Conclusion

The basic condition for a successful business is access to information. Reliable information base improves the performance and competitiveness of the company in the market. It enables managers to make quality and timely decisions and contribute to the growth of the company.

In conclusion, it can be stated that to create high-quality information support for managers is not just a matter of implementation information systems and technologies. Another essential request is to have good and decision-making level of the managers, who are able to extract offering opportunities from accounting software and use them to the correct decision. The correct motivation of the people who will operate the system is very important because the willingness and information literacy of users are important assumption for the system to provide the requested information, to deliver the expected results and to become a real competitive advantage for long-term and stable operation of a company.

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Cash accounting information system before and after the amendment to the Act on Accounting as of 2016

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Abstract
The aim of the article is to perform an analysis of cash accounting development and evaluate its new proposition. Cash accounting gained the status of an accounting system by the historically first Act on Accounting of 1991. As of 2003, the option to keep cash accounting was irretrievably cancelled for natural persons. Cash accounting gradually transformed from an accounting system into a marginal issue of bookkeeping without operative legal rules. Since January 2016, if the requirements explicitly stated in the Act on Accounting are met, cash accounting can be kept by legal persons. The accounting entity must not be value added tax registered, the total income must not exceed CZK 3 million, the value of its property must not exceed CZK 3 million, and it must be among the enumerated non-profit organizations. The research results confirmed that cash accounting has not returned to the status of an accounting system. In an attempt to alleviate the administrative burden for small non-profit organizations, a form of bookkeeping was created, not a fully-fledged accounting system with all the attributes of faithful and fair depiction.

Keywords: *accounting, cash book, published, summary statement*

JEL classification: *A20, M41*

1. Introduction

Accounting is a principal axis of an economic information system. Paksiová and Janhuba (2012) see accounting as a compact and irreplaceable source of information for all users. The primary task of the information system is to provide information. Internal and external users acquire answers to questions due to the available information. Tumpach and Bastincova (2014) question whether the extent of available information is sufficient for the users. They see the cause of satisfaction of the spectrum of users in extending the published information. Lysek and Dadok (1994) appreciate the complex and systematic nature of accounting. An accounting concept reflects historic traditions and erudition of its creators and reacts to the needs of practice. According to Riahi-Belkaoui (2004), accounting is a fundament of calculations of economic markers for past, present and future periods. The structure of a national accounting system is based on historical roots and specifies development phases. Zelenka and Zelenkova (2013) analyse the historical roots of Czechoslovak accounting and emphasize the built-in control mechanisms making accounting a conclusive system. The transition from a centrally planned economy to a market economy created the need for codification in the area of accounting Slosar (2008). The result was the issue of the historically first Act on Accounting of 1991. The Act on Accounting provided methodical rules, which related to the accounting entities keeping books in the double-entry or single-entry accounting systems. Accounting records are kept by accounting entities from their formation until dissolution for each accounting period. It is thus the only mandatory information system an accounting entity is required to keep continuously from its formation until dissolution (2015). Due to the parallel of economic activity and accounting, systematic units of organized information are created. Brezinova (2014) points out the interesting historical development of single-entry accounting and acknowledges that it deserves more

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attention. According to Kovanicova (2005), accounting is the product of a surrounding environment. The ability to react to changes makes accounting an active system.

2. Goal and Methodology

The impulse resulting in creating the article is the new arrangement of the structure of the national accounting system. The twenty-ninth amendment to the Act on Accounting brings extensive changes, one of them being the legalization of cash accounting. The statement of reasons for this amendment refers to the demand for cash accounting from small accounting entities.

The aim of the article is to perform an analysis of its development and assess the new concept of cash accounting. Extensive research created knowledge material. An analysis of the findings made it possible to divide the development of single-entry accounting into time phases. An inseparable part of the goal was to point out the shortcomings of the new concept and create modification suggestions. The benefit of the article is to make the decision easier for the aspirants when selecting an accounting information system. This choice can, according to the statement of reasons, be relevant for many small accounting entities in the coming years. The concept of single-entry accounting consists of methodical components. Lysek and Dadok (1994) consider the methodical elements to create more detail in the concept. They question the rightness, suitability and purposefulness of the methodical elements of single-entry accounting. They, however, recognize their irreplaceable role in keeping single-entry accounting records aiming to attain a unified methodical procedure by all accounting entities.

3. Results and Discussion

Molin (2015) mentions the problematic keeping of single-entry accounting records from 2004 according to the abrogated laws. In the previous years, keeping single-entry accounting records was regarded as a relict. Its keeping had no legal basis Krbeckova and Plesnikova (2010). Sporadic information about single-entry accounting legalization created the environment of uncertainty and expectation from 2014 on.

3.1 Historical View on Single-Entry Accounting

Slosar (2008) mentions polemics on which accounting form is older. Whether single-entry or double-entry. There are historical records on both of them. Dobie (2012) documents the permanent effort of property owners to perform itemization – stocktaking throughout history. Economic entities have always needed records in a form adequate to the time period. Single-entry accounting was used for small economic entities requiring systematic and chronological data. From this aspect, single-entry accounting can be regarded as parallel to double-entry accounting. Blechova, Janouskova and Sobotovicova (2013) comment on accounting statements from the aspect of their connection to establishment of tax liability. Correctness of the data is evidenced by information from an accounting database. According to them, financial reporting of all accounting entities is a reflection of the current legislation and requirements of the users. Hrdy and Placha (2008) emphasize a significant common characteristic of accounting systems, and that is the ability to dynamically react to the changing outside environment. If an accounting system was not able to evolve, it would be doomed to abandonment for non-functionality. In history, accounting evolved impulsively.

The historically first Act on Accounting was issued in December 1991 and became effective as of the beginning of 1992. In its first part, it set the duty of accounting entities to keep accounting records in the double-entry or single-entry accounting system. Two equal

accounting systems were created. All accounting entities could keep double-entry accounting records; selected accounting entities could opt for single-entry accounting. According to this law, single-entry accounting records could be kept by both natural and legal persons. Kovanicova (2004) clarifies the system of accounting law and national control of accounting. Laws are accompanied by implementing regulations for accounting. At first these were in the form of Ministry of Finance Measures, from 2002 on they were Ministry of Finance Regulations for the individual types of accounting entities. Literature explaining the rules of single-entry accounting and examples of its keeping was published Holecek and Kleisner (1996). Methodical principles of single-entry accounting were compiled with the goal to form a functional accounting information system.

A turn in the development of single-entry accounting came in 2004. In connection with the anticipated accession of the Czech Republic to the European Union, legislative norms were repealed, amended and issued anew. This situation radically influenced single-entry accounting. An amendment to the Act abolished it for natural persons. The conditions for legal persons were limited and the option to keep it was to end on 31st December 2004. The line of keeping accounting in the full or simplified extent for all accounting entities was enforced Kovanicova (2004). With respect to small non-profit organizations which fought for survival, keeping accounting records seemed financially and organizationally very burdening. A transitional measure of the Act allowed them to continue keeping single-entry accounting records. Keeping them was not supported by legal regulations. Stejskal, Kuvikova and Matatkova (2012) emphasize the incorrectness of this approach in relation to the accounting entities which were forced to switch to accounting due to this situation.

Effective from 2008 on, the Act on Accounting was amended to allow keeping single-entry accounting records when the enumerated requirements were met, although without a legal basis. Not only laymen, but also professionals considered single-entry accounting to have been abolished. Due to lack of interest from legislators, using outdated and invalid legislation, civic associations, churches and religious legal persons, and hunting associations fought the difficulties of single-entry accounting in accordance with the legal regulations of 2003. The condition for making use of the exception was keeping single-entry accounting records as of 31st December 2003 and, at the same time, not exceeding the limit for the total income of CZK 3 million in the last closed accounting period. Stejskal, Kuvikova and Matatkova (2012) appreciate the effort of accounting entities to maintain continuity, systematic procedure and complexness in this problematic situation. Up until the end of 2015, no changes in legal regulations legalizing single-entry accounting were implemented.

Another turn came with the year 2016. In 2014, the new Civil Code became effective, which brought about a wave of recodification. It impacted non-profit organizations by defining the status of public benefit. In 2013, a new Directive of the European Parliament and of the Council on the Annual Financial Statements and Consolidated Financial Statements in the EU (2013/34/EU) was issued. The member states were obliged to implement it by July 2015 Mullerova (2014). These circumstances gave rise to the need for extensive amendment to the Act on Accounting. The endurance of non-profit organizations keeping single-entry accounting records resulted in its resurgence Brezinova (2014). Single-entry accounting has begun a new phase in 2016, which is legally supported by an act and a regulation for the accounting entities keeping single-entry accounting records.

3.2 Single-Entry Accounting in the Years 1991-2003

The newly issued Act on Accounting can be called universal. It dealt with the status connected to an accounting entity in a complex manner. It defined the basic accounting terminology, accounting systems, accounting documents, accounting periods, accounting

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entries, accounting books, valuation of assets and liabilities, depreciations, taking inventory, financial statement and other things. All legal persons were accounting entities without exception. Natural persons were concerned if they conducted business or were self-employed and, at the same time, stated their expenses spent on acquiring, procuring and maintaining income for tax purposes. The Commercial Code defined the obligation to keep double-entry accounting records for the natural persons registered with the Commercial Register. A methodical support issued under the name Ministry of Finance Measures elaborated on the requirements of correct bookkeeping. Paksiova and Janhuba (2012) describe a close connection of single-entry accounting to the tax system. They appreciate the smaller extent of necessary adjustments when compiling the financial statement, than in double-entry accounting. In relation to the anticipated accession to the European Union, a harmonization process started in accounting. From 2002 on, regulations for all types of accounting entities became effective (entrepreneurs, financial institutions, insurance companies, non-profit organizations, state and local authorities). Subsequently, a regulation concerning all accounting entities was issued allowing them to keep single-entry accounting records regardless of whether they were natural or legal persons Kovanicova (2004). The provisions concerning the single-entry accounting system stood until the end of 2003. It is a paradox that the regulation on keeping single-entry accounting records was only effective for one year.
The basic attribute of this phase is equal position of the two accounting systems. As a result of the new laws, basic principles of keeping accounting records were set, an accounting period (calendar year) was defined, and these were the periods for which accounting records were kept and a financial statement was compiled. Legal persons could keep single-entry accounting records when stipulated requirements were met. All activities concerning the subject of accounting were evidenced by accounting documents in a written form. The documents had mandatory content. The extent and content of accounting books were set. The content of accounting books was designed in a way that, if kept precisely, it was possible to establish the closing inventory of all recorded items both during and at the end of an accounting period. Single-entry accounting records could be kept in written, later in technical form. During and at the end of an accounting period, stocktaking was performed according to the liquidity of individual items. A financial statement was compiled as of the last day of an accounting period with prescribed contents and form in standardized templates. A special legal regulation which amended the requirements of keeping accounting records was the Commercial Code. It became effective as of January 1992 and its Chapter IV amended accounting of entrepreneurs. This phase lasted, with minute methodical adjustments, until the end of 2003.

3.3 Single-Entry Accounting in the Years 2004-2007

The Act on Accounting was amended and the single-entry accounting system disappeared from it together with all the related provisions Molin (2015). The regulation on keeping single-entry accounting records was also abrogated. This break-through law meant an irreversible end of single-entry accounting for natural persons. They were assigned with keeping the newly emerged tax records, which were used to determine a tax base correctly. In the Act, the term double-entry accounting was replaced with accounting. The Act on Accounting included a new version of accounting in the simplified extent. As regards methodology, Article II Transitional Measures allowed legal persons which had kept single-entry accounting records as of 31st December 2003 to switch to accounting as of 1st January 2005. This transitional law proved important, as it was renewed yearly and its effect extended over each accounting period up to 2007. This unclear situation was terminated in 2007. A new provision § 38a was added into the Act on Accounting. Effective as of January 2008, it allowed keeping single-entry accounting records without a legal basis. Bychkova and

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Itygilova (2014) study the concepts of the accounting systems. In their opinion, the concepts do not correspond to the users' needs. They see the cause in an inadequate reaction of the accounting methodology development.

The basic attribute of this phase is the lack of legislative support for single-entry accounting. Single entry accounting transformed from an accounting system to keeping records without legal regulations in force. In this phase, transition from single-entry accounting to accounting began. Despite this problematic situation, there are no national or regional surveys, which would summarize the number of affected accounting entities. From the aspect of development of the accounting system, there was stagnation. The result was freezing the conditions for keeping single-entry accounting as of 31st December 2003 for further use.

3.4 Single-Entry Accounting in the Years 2008-2015

From 2008 on, the provision § 38a was in force. It allowed legal persons to continue keeping single-entry accounting records when three requirements were met. They had to be accounting entities which had kept single-entry accounting records as of 31st December 2003. The second requirement was presence in the list of accounting entities. They had to be civic associations, churches and religious societies, or church institutions, or hunting associations. The third requirement was not exceeding the total income of CZK 3 million in the last closed accounting period. The law did not return and keeping single-entry accounting records followed the cancelled legal regulations. Keeping single-entry accounting records was not permitted to newly-emerged accounting entities. Transition from accounting to single-entry accounting was also not permitted. Accounting entities which yielded to the pressure and switched to accounting in the course of 2004 could not take advantage of this situation.

The basic attribute of this phase is freezing the conditions for keeping single-entry accounting records as effective in 2003. From the aspect of development of the accounting system, it was a period of decline.

3.5 Cash Accounting Since 2016

Drachal (2014) sees accounting as an active interdisciplinary system. According to the overall concept, it is able to collect, provide and archive information. Since 2016, accounting has been divided again into two forms of keeping records. Unlike in 1992, a form of accounting has been created primarily oriented to cash flow – cash accounting. As of the first of January an amendment to the Act on accounting became effective as well as a new Regulation for accounting entities keeping cash accounting records. Neither the act nor the regulation uses the term accounting system, only cash accounting. The Act on Accounting now defines aspirants to cash accounting. Molin (2015) explains that there are four cumulative requirements that must be met simultaneously and the last requirement is alternative. An accounting entity:

- is not value added tax registered
- the total income in the last closed accounting period must not exceed CZK 3 million
- the value of its property must not exceed CZK 3 million, and
- is an association or union organization, or employers' association, or church and religious society, or church institution, or hunting association.

It is clear from the list of requirements that keeping cash accounting records is only allowed for non-profit organization legal persons. If accounting entities meet the requirements, they can keep cash accounting records from 2016 on. This situation is also relevant for newly created accounting entities, if they assume to meet these requirements in the first year of operation. If an accounting entity ceases to meet the requirements, it must switch to the double-entry accounting system in the full or simplified extent. It starts keeping double-entry

accounting records as of the first day of the accounting period following the period in which this fact is ascertained. From the aspect of being consistent with the methods, it is possible to switch back to cash accounting only after five successive accounting periods have passed. The Act prescribes the duty to keep three accounting books. A Cash Book chronologically records incomes, expenses, current items and the like sorted into main (non-profit) and economic (complementary) activities. A Book of Claims and Liabilities chronologically records debtors and creditors. Supplementary books of other property components record mostly tangible and intangible fixed assets, financial assets, stock, stamps. Closing balances of accounting books are used to compile a Summary of Incomes and Expenses and Summary of Assets and Liabilities correctly. Summaries are compiled no later than six months after an accounting period ends. They do not represent a financial statement comprised of an inseparable collection of accounting statements, but closing books. Strouhal, Pasekova and Redinova (2012) stress the importance of financial reporting with respect to the harmonization process and note that this situation has been present in accounting since the 20th century and concerns double-entry accounting. They recognize the financial and organizational difficulties of bringing harmonization into accounting of accounting entities. As for the differences between double-entry and cash accounting, the Act states which provisions of the Act do not apply to cash accounting while its ability to depict the subject of accounting and financial situation of an accounting entity faithfully and fairly remains intact. E.g. excluding chart of accounts, book depreciations, adjustments, financial statement. On the other hand, the duty to publish is emphasized. Cash accounting is connected to the duty to publish the Summary of Assets and Liabilities by means of delivering it to a public register, with which an accounting entity is registered.

The basic attribute of this phase is the absence of the accounting system of single-entry accounting. A form of accounting for a selected circle of accounting entities was established. The issued regulation sets the scope of the contents of accounting books to ensure correctly compiled summaries. Summaries should provide comprehensive information on incomes, expenses, inventory of assets and liabilities of an accounting entity. The Act on Accounting respects this situation and as for legal certainty (as opposed to the legal uncertainty of the previous year) considers keeping cash accounting records according to the legislation of 2016 appropriate.

3.6 Discussion

From the aspect of the range of accounting information, cash accounting has been assigned a lower level. It is primarily intended for economically insignificant accounting entities. Ghignoli (2006) deals with the principles of keeping cash accounting records by the church, in current terms by a non-profit organization, as evidence in resolving disputes using permanent records in a simpler form. Formation of single-entry accounting in the national system began with its recognition as an accounting system in 1991. Single-entry accounting records kept by natural or legal persons started to fulfil accounting principles. From the point of view of their size and significance, single-entry accounting was devoid of methodical elements which are characteristic for double-entry accounting with keeping books in a system of accounts. Incomes and expenses were recorded precisely and their difference is used for tax purposes. At the same time, recording assets and liabilities documented inventory and changes of inventory of property components. Single-entry accounting corresponded to the time of its creation and was the result of the influence of the outside environment. Edwards (2015) studies the influence of the outside environment on the evolution of accounting thinking. He considers the Industrial Revolution to be a significant step forward, as it also initiated a new direction in accounting theory development. This confirms the relation between the development of human thinking, knowledge and elements of systematic procedure.

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Due to changes of the environment in the Czech Republic, single-entry accounting was modified. It had to meet the requirements on information ability. Changes in legal regulations before 2003 were leading single-entry accounting to the position of a used and functional accounting system. Its output was a financial statement with accounting statements. Suranova (1998) sees the purpose of a financial statement in providing information to laymen. An accounting entity had the power to voluntarily expand its accounting statements, possibly also for laymen. Supplementary books usually included an inventory book, stock ledger, wage records, drivers' logbooks, books of adjustments and the like. Not only non-profit organizations, but also natural person entrepreneurs and the public perceived single-entry accounting as a source of information. Single-entry accounting was taught in the education system of secondary schools and universities. A vision of forming a parallel accounting system with adequate obligations was being fulfilled. If this trend had continued, there would probably be a functional and continual accounting system today with sufficient information abilities. The Slovak Republic, which also started forming single-entry accounting in the common state, never cancelled this system. The current national accounting structure is comprised, unlike in the Czech Republic, of two equal systems of double-entry and single-entry accounting. In both accounting systems, a financial statement is compiled in the form of a structured presentation of facts which are the subject of accounting. A financial statement is provided to persons using this information. In this context, Kordosova (2015) mentions the duty to publish a financial statement by delivering it to the Register of Financial Statements.

The phase of stagnation and decline harmed the single-entry accounting system. By tolerating its legal state, the instigators of the amendment presented the insignificance of certain accounting entities. The weighty decision to cancel single-entry accounting altogether was not taken. The weighty decision to return single-entry accounting to a legal state was not taken either. This situation is also a reflection of the outside environment.

The accounting system declared for non-profit organizations was not renewed in 2016. The associations, institutions and foundations specified in the Civil Code must settle for cash accounting. These non-profit organizations are legal persons, thus accounting entities. They undertake mostly non-profit activities based on public benefit and generating profits is not their goal. They are the recipients of financial resources in the form of subsidies, contributions, grants and so on. To secure the recording of balance and movement of money, it is important to keep records based on accounting principles. The amendment instigators accepted that double-entry accounting in the simplified extent is financially and organizationally taxing for these accounting entities.

By means of an extensive research and excursion into the past, the obtained findings divide the development of single-entry accounting into four incomparable phases.

Table 1: Development of single-entry accounting information systems in the years 1991-2016

Phase	Concept Elements
1991-2003	Accounting system with obligations according to the Act on Accounting. Single-entry accounting records are kept by legal and natural persons both conducting and not conducting business, if they meet requirements. Accounting period is a calendar year. Accounting transactions are documented by accounting documents, mandatory content in the Act on Accounting. Two mandatory accounting books – Cash Book and Book of Claims and Liabilities. Incomes and expenses in a Cash Book sorted for tax purposes. Book depreciations are not recorded. Duty to take inventory according to the Act on Accounting. Financial statement is comprised of the Statement of Assets and Liabilities and

	Statement of Incomes and Expenses.
2004-2007	Single-entry accounting does not have a status. Although keeping books according to the abrogated regulations is tolerated until 2007.
2008-2015	Single-entry accounting does not have a status. Although keeping books according to the abrogated regulations is tolerated until 2015.This situation is made possible by the Act on Accounting.
2016-	Cash accounting is not an accounting system; obligations are set by the Act on Accounting. Cash accounting records are kept only by legal persons – selected non-profit organizations. Accounting period is a calendar year, business year cannot be used. Accounting transactions are documented by accounting documents, mandatory content in the Act on Accounting. Three mandatory accounting books: Cash Book, Book of Claims and Liabilities, supplementary accounting books of other property components. Incomes and expenses sorted in the Cash Book into the main and economic activity. Book depreciations are not recorded. Duty to take inventory according to the Act on Accounting. Summary of Assets and Liabilities and Summary of Incomes and Expenses close accounts. Duty to publish the Summary of Assets and Liabilities in a public register.

Source: compiled by the author

The new concept of cash accounting of 2016 has its pluses and minuses. After twelve years, accounting was legalized (revived, reintroduced, renewed). The contents of mandatory accounting books were defined. The purpose of cash accounting was defined as providing complex information on incomes, expenses, inventory of assets and liabilities. Accounting entities can keep other supplementary accounting books as necessary without limitation. Individual or summarized outputs of these books can be used to extend the range of information provided to internal and external users. By prescribing the duty to publish, it is possible to gain access to the inventory of assets and liabilities, which can be an important piece of information for the donors of non-profit organizations. Cash accounting is again in the position of a source of information for tax purposes. The Act on Accounting declares correctness of keeping accounting records by adhering to the new duties. Even though they are accounting entities, selected provisions on the Act do not apply to them. To remove vagueness, these cases are specifically listed. The concept is based on the emphasis on recording the balance and movement of money (recording incomes and expenses).

Not putting cash accounting back into the position of an accounting system can be seen as a downside. Its status is not clear; the Act does not mention an accounting system or financial statement. As Janhuba (2010) aptly observes, cash accounting has always faced many methodical shortcomings. The fact is that it does not have the same inner links and control mechanisms as double-entry accounting. The main conclusive element of cash accounting is then always stocktaking.

This downside could be removed by recognizing cash accounting as an accounting system, as it was the case previously. A possible change of requirements for using it is that the cash accounting system could be designated only for non-profit organizations. Non-profit organizations have specific requirements in the collection of laws comprising the tax system. The Civil Code brought unification of their legal forms. A change of laws on keeping accounting records of non-profit organizations could lead to unification and elimination of chaos in the given area. It can be expected that cash accounting will be subject to changes in

the coming years. There is definitely the need to unify the Summaries into one methodically unified form, so that the public register would not contain creations compiled in good faith.

Another controversial part of the new concept can be the concurrent existence of cash accounting and tax records. Tax records emerged in 2004 and they are intended only for natural person entrepreneurs. Both these information systems record assets and liabilities. To specify the contents of property elements, the legal regulations for accounting should be used. For tax records it is the Regulation on Keeping Accounting Records of Business Entities. In cash accounting it is the Regulation on Keeping Accounting Records of Non-Profit Subjects.

4. Conclusion

Elements of single-entry accounting are documented in historically remote periods. Regional and later state structures chose accounting system structures reflecting their time. The principles of single-entry accounting were embedded into the accounting law system in 1991. The path originally taken with the vision of development was abruptly diverted by the accession to the European Union. Subsequently the frozen system put into a dismal situation due to invalid legal norms became a marginal matter and it became a product of its more or less erudite users. As the time passed, the decision of 2003 proved non-conceptual (a regulation valid for one year). Acceptation of arguments and a change of environment were the cause of legalization of cash accounting in 2016.

Due to the non-conceptual verdict, cash accounting is standing at the beginning of a new developmental stage. It is likely that cash accounting will become a topic of interest for theorists and practitioners aiming to form a functional economic information system. Cash accounting will eventually be taught again in educational institutions with economic specialization. The sum of these activities could guide cash accounting through the initial stage and facilitate further progress.

To draw inspiration, it is possible to study the requirements for keeping single-entry accounting records in the Slovak Republic. The Slovak Republic has been proceeding more prudently since 1993, when they recognized the single-entry accounting system as viable and adequate for accounting entities even in the 21st century. With continuity and faithful and fair depiction in mind, a functioning system has been created that satisfies the users and provides information on the subject of accounting.

Dedication

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Environmentally oriented accounting and issues of ensuring software

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Abstract
In the article, the authors focus on the following three thematic areas:
1. *the importance of environmental information to enterprise management, which are contained in the international legal standards and highlighted the international environmental conferences,*
2. *the analysis of the current state of ensuring software for environmentally oriented accounting and the issue of valuation input data,*
3. *the possibility of greening costs and revenues in the accounting – in particular through the code list.*

In the conclusion, the authors point out recommendations, necessary for implementation of environmentally oriented accounting into practice enterprise as a tool for ensuring information to management activities.

Key words: *code lists, enterprise management, ensuring information, environmentally oriented accounting, greening of costs and revenues, software, valuation of input data*

JEL Classification
M41, M21, Q56, C87

1. Introduction

One of the most significant trends of the current development is the greening of all areas of public life. This raises the need for changes in indicators of market regulators to take into consideration the environmental component of development. In this context, the importance to review the interdependence and interconnectedness of economic and ecological processes and also in the accounting system (Barinova, E. E., 2014).

Awareness of the importance of the ecology is continued the necessity of spending to protect and regenerate the environment. This indicates the need of the environmental accounting. Managerial decisions should be taken into consideration not only an interests of the enterprise but also the general social and economic challenges in the protection of air, water, soil resources and human health. This requires good information of the environmental accounting. The environmental accounting is including the records of environmental costs, environmental liabilities and environmental reporting (Chkhutiashvili, L. V., 2014).

Environmental management accounting represents a combined approach, which combines information on material and energy flows (expressed in physical units) and information on the costs and revenues (expressed in monetary units) with a view to increasing efficiency of saving material, reducing the environmental impact of the enterprise and reducing the costs of environmental protection **(**Durdiak, M. & Gondáš, J., 2011).

After 2010, in the framework of the enterprise reporting have been discovered a new direction - integrated reporting. An integral part of integrated reporting is reporting of sustainable development (Global Reporting Initiative, 2013).

The reporting of sustainable development is a process, which is closely connected to setting objectives, measuring performance and managing change towards a sustainable global

economy. This is a combination of long-term profitability with social responsibility and responsible attitude to the environment (Hyršlová, J. & Kubáňková, M., 2015).

The need to measure and manage the impacts of activities on society and the environment are resulted from economic globalization, global governance, closely related to the exploitation of natural resources and energy consumption, the climate changes and biodiversity, the threats to global security, demography and migration (Jasch, Ch., 2015).

Quality solutions of environmental protection require the establishment of a comprehensive enterprise information system, which should be the results of environmental monitoring connected to the economic system, and which should fully ensure the management of environmental accounting (Látečková, A., 2006).

The key objective of the article is:

1. to point out the importance of environmental information in an enterprise management,
2. to analyze the status of the current state of ensuring software for environmentally oriented accounting,
3. to present the proposal of the authors for the greening of the structure of costs and revenues in an accounting.

2. Data and Methodology

The source material for writing the article was acquired:

- through the authors conducted research in the selected enterprises in the Slovak Republic,
- through the study of professional and scientific Slovak and foreign literature sources,
- through own work aimed at formulation of proposals for greening accounts of costs and revenues in an enterprise.

The source material was processed by **the methods** of controlled conversation with managers of selected enterprises, selection, comparison, tabular and graphical data processing, method of analysis and synthesis.

3. Results and Discussion

3.1 Importance of environmental information in enterprise management

Monitoring the impact of enterprise activities on the environment are required an adequate management system – oriented environmental management. Environmentally oriented management is required appropriate environmental oriented information system, an important part of which is environmentally oriented accounting.

For the coordinated introduction of environmental management are used mainly two important international standards:

- International Standards ISO 14001,
- Environmental management system and audit EMAS (Eco-Management and Audit Scheme) applicable in the European Union.

The acceptance of both norms is voluntary for the enterprise. The importance of its implementation is a result of several factors, eg .:

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- one of the conditions for the entry of enterprises to the European Union markets is ecological certificates of final products and all of its sub-components,
- direct payments to farmers under the Common Agricultural Policy of the European Union are also subject to observance of legislation regarding the environment,
- in certain countries, the introduction of environmental management system is taken into consideration, for instance by the insurance company, reducing taxation, providing of soft loans and leading to a decrease of charges for environmental pollution.

All this leads to an increase in competitiveness, because enterprises with established ISO or EMAS are in a better position, more confidence on the market and cease to be a potential environmental threat to its surroundings.

The introduction of an environmental management system is supported by the national legislation of individual countries – in Slovakia is mainly Act. 468/2002 Coll. on environmental management system and audit, which is connected to EMAS.

The mentioned legislative norms requires the introduction of environmental accounting indirectly. However, the introduction of environmental accounting requires financial legislation directly. The Act no. 431/2002 Coll. on the Accounting obliges from 1.1.2005 in § 20 to accounting entities with the audit obligation in the Annual Report and also information on the impact of its activities on the environment.

The importance of the issue of the introduction and use of environmental accounting is evident from the fact that its regularly engaged in international conferences accountants, organized by the International Federation of Accountants (IFAC), the Chartered Institute of Management Accountants (CIMA), the European Accountants Association (EAA), the European Management Accountants – (EMAA), EMAN (Environmental Management Accounting Network) and others.

Very interesting and useful information can be expected from the conference "Two Decades of Corporate Environmental and Sustainability Accounting. What has been achieved?", which will be held in September 2016 in Lüneburg, Germany. In particular, the conference aims to summarise the achievements and provide an outlook for the future with regard to the next key topics in corporate sustainability accounting. More information can be found at http://www2.leuphana.de/umanagement/projekte/eman/lueneburg-2016/.

A great contribution to the development of theory and methodology of environmentally oriented accounting has also the UNO: The United Nations Environmental Programme (UNEP), United Nations Conference on Trade and Development (UNCTAD), the United Nations Commission on Sustainable Development (CSD), the Intergovernmental Working Group of Experts on International Standardization of Accounting and Reporting (ISAR).

The analysis of the environmental performance of the Slovak Republic carried out by the OECD, indicates information that should not be missed in environmental accounting in the Slovak enterprises - selected of analysis are mentioned serial numbers 10, 11 and 12 in the literature.

3.2 Current state of ensuring software for environmentally oriented accounting

Environmental accounting software may provide data which highlight both the contribution of natural resources to economic well-being and the costs imposed by pollution or resource degradation. Environmental quality of accounting information can have a substantial impact on the acceptance of management decisions. Environmental accounting software formulates environmental accounting information in order to optimize the cost of nature conservation,

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increase the efficient use of material, waste reduction and elimination of waste, reduce the risk of business and the negative impact on the environment, acceptance of management decisions on environmental protection. The elimination of problems and maintain good environmental status are required adequate information to the internal and external enterprise environment. At the enterprise level of environmental information that are monitored in the environmental management accounting. This concerns in particular, information on environmental costs and revenues but also information about environmental assets and liabilities.

In Slovakia environmentally oriented accounting falls within the competence of the Slovak Chamber of Certified Accountants, the Slovak Union of Accountants, Slovak Chamber of Auditors and the Ministry of Finance. It should be stated, that currently the environmental accounting is not sufficiently addressed in Slovakia.

Currently on the world market, there are a several environmental management systems to monitor the environmental performance of small and medium-sized enterprises. However, the most important environmental information for management decisions are just information about environmental costs. The current accounting systems in an inappropriate way retrieve, record, track and evaluate environmental costs. Mostly are taken into consider only the cost of disposing of waste. However, the costs caused by the material waste or in the production of a waster are not taken into consider. Regarding the compilation of calculation, environmental costs are usually included in overhead costs and divided equally to all outputs.

For improving quality of environmental accounting software, input and output data should be based on the accounting information falling within the environmental costs and revenues. Considers it essential, that the enterprises have chosen the appropriate software, which provides reciprocal links of an accounting information on the environment and environmental management. Output data reflecting the more reliable results of monitoring environmental characteristics, which would be suitable for management decision-making (enterprise management). However, this type of software is difficult to recast and a valuation of input data in monetary units is also problematic. In the next part of this article we have proposed possible solutions.

3.3 Possibility of greening costs and revenues in the accounting

The structure of the costs and revenues is suitable to greening in accordance with the requirements of the environmental management system, which is implemented in the enterprise. It would be ideal, if the structure of costs and revenues have been enabled to compile certain reports in the accounting for environmental management.

In our opinion, one of the options to the greening of the structure of costs and revenues are adding environmental codes to specific environmental costs and revenues. Each costs and revenues can be characterized in ecological terms as environmentally positive, environmentally negative and, where needs, environmentally neutral too. We see two ways, how to present these environmental characteristics of costs and revenues in the accounting:

1. to present environmental characteristics right in the number of sub-account for costs and revenues. In the practice this would require a modification of the existing chart of accounts and possibly to expand the number of sub-account of at least one place in the practice,
2. to maintain the existing chart of accounts and develop the environmental code list. The relevant code would be allocated to existing sub-account of costs and revenues from environmental code list.

The proposed options are presented in table 1.

Tab. 1: A proposal for consideration of environmental characteristic of selected costs and

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revenues

Number and term of main account (type of cost and revenues)	1. option Environmental characteristic as part of sub-account number	2. option Environmental characteristic as a code for sub-account number	
		an sub-account	an environmental code
501 Consumption of material	501 xxx1 – Consumption of material with environmental certification	501 xxx	E1
	501 xxx0 – Consumption of material within production standards	501 xxx	E0
	501 xxx2 – Consumption of material over production standards	501 xxx	E2
502 Consumption of energy	502 xxx1 – Consumption of energy from alternative sources – Consumption of bioenergy	502 xxx	E1
	502 xxx2 – Consumption of energy from sources of polluting the environment	502 xxx	E2
518 Other services	518 xxx1 – Costs of wastewater treatment and air	518 xxx	E1
	518 xxx1 – Costs of waste disposal	518 xxx	E1
	518 xxx1 – The cost of rent for environmental equipment	518 xxx	E1
	518 xxx2 – Costs of elimination of environmental damage caused by enterprise	518 xxx	E2
	518 xxx1 – Costs of education about environmental protection	518 xxx	E1
	518 xxx1 – Costs of environmental audits	518 xxx	E1
538 Other taxes and fees	538 xxx0 – Fees for environmental protection according to law	538 xxx	E0
	538 xxx2 – Fines for excessive environment pollution	538 xxx	E2
551 Depreciation charge and amortization charge	551 xxx0 – Depreciation of machinery with the classic environmentally friendly technologies	551 xxx	E0
	551 xxx1 – Depreciation of machinery with no-waste and low-waste technologies	551 xxx	E1
	551 xxx2 – Depreciation of net book value of a discarded machine, which caused environmental damage	551 xxx	E2
601	601 xxx1 – Revenue from sold own products with environmental certificate	601 xxx	E1

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Revenue from sold products	601 xxx0 – Revenue from the sale of ordinary own products	601 xxx	E0
648 Other operating income	648 xxx1 – Revenues from the sale of recyclable waste	648 xxx	E1
	648 xxx1 – Income from material acquired free of charge with environmental certificate	648 xxx	E1
	648 xxx0 – Income from cash donations	648 xxx	E0

Source: own processing

Explanatory Notes:

E – environmental characteristic of costs or revenues

E1 – cost/revenue environmentally positive

E2 – cost/revenue environmentally negative

E0 – cost/revenue environmentally neutral

Meanwhile we stated only a basic breakdown of the environmental characteristics of costs and revenues, i.e. the breakdown at environmentally positive, environmentally negative and environmentally neutral costs and revenues. The creation of ecological codebook is planned in the future. After taking account of other environmental criteria, it will be included more numeric characters.

Assigning these basic environmental characteristics of costs and revenues will cause problems in practice if hitherto used sub-accounts contain mix of costs or revenues - for example environmentally positive and also environmentally negative. It is necessary to divide these sub-account for ensure unambiguous identification of environmental characteristics of costs and revenues.

4. Conclusions

Enterprise accounting system should be consistent with the current requirements of environmental management, it is necessary to innovate its content extension of the conventional accounting information on the environmental information and thus gradually develop the environmentally oriented accounting. In particular, it relates to information on costs and revenues, which requires the following:

- to review the accounts of costs and revenues in an enterprise, and adjust these accounts in order to record at least the most relevant types of environmental costs and revenues, such as environmentally positive, environmentally negative and environmentally neutral costs. We proposed the possible approach in an article in section 3.3,
- to pay attention to supplement the chart of the environmental characteristics of the main accounts, those types of costs that are identified as critical to national and international documents of environmental protection,
- to determine the types of assets and financial resources, that need to be monitored with increased attention, because they can lead to undesirable environmental costs. These types to monitor on special sub-accounts in the accounting and environmental reports.

It should be first conceptually solved the mentioned problems of greening accounting, outside an accounting software and then implement accepted the concept of adjusting the accounting

software so that it gradually becomes of software for processing of the environmentally oriented accounting. In our opinion, the accounting software modification is necessary to initiate systematic adjustment of the code list.

Ideal approach, would be the greening of the costs and revenues structure in the enterprise accounting system in accordance with the requirements of the enterprise environmental management, and to allow compiled in addition to the necessary financial statements and any statements for environmental management or part of these statements.

The necessity of greening the accounting software and searching the penetrations with software for environmental management are a challenge for enterprise IT experts and for software companies.

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Transfer pricing of transactions between related parties in the Slovak Republic

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Abstract
Transfer pricing is the setting of prices for transactions between related parties for tax purposes in order to meet the arm´s length principle. Unrelated relationship is characterized by the fact that parties participated in the mutual transactions pursue their own interests and their aim is to achieve the highest profit. Related parties often pursue the mutual aim and they try to obtain the highest profit for a group. If prices applied in business relationships between related parties differ from comparable business relationships between unrelated parties, the related party is obliged to adjust the tax base to a difference. In order to determine a difference, several methods of transfer pricing or their combinations are used. The Slovak Republic adopts the methods of transfer pricing pursuant to the OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations which are based on the comparison of prices and the comparison of profit. Since 2015 the rules of transfer pricing has been enlarged to the obligation to keep the documentation on used methods of transfer pricing except for foreign related parties to domestic related parties as well in order to minimize the tax evasion. The article aim is to assess the transfer pricing in the Slovak Republic and to review the strengths and weaknesses of individual methods of transfer pricing.

Keywords: *arm´s length principle, documentation, method, related parties, transfer pricing*

JEL Classification: *H25, H71, M41*

1. Introduction

Measurement belongs to the most complicated problem in the theory and accounting practice as well as in the tax area. The issue of transaction measurement between related parties for purposes of income tax is currently growing by both taxpayers and tax administrators. Globalization as an economic process progresses further and its negative effects are manifested in excessive profit shifting from their countries of origin do tax havens. Transfer pricing appear to be an appropriate solution to this global economic problem (Rajnoha, Slivková & Dobrovič, 2014). Transfer pricing is the phenomenon by which related corporate entities in different jurisdictions determine the price at which a transfer of goods or services between those two entities should be deemed to have occurred. This phenomenon is an inherent and endemic part of the international trading system (Bastin, 2014).

Taxpayers are focused on decreasing of their taxable business income so they are interested in the profit creation in place where it is the most tax advantageous (Solilova & Nerudova, 2013). This advantage can be achieved by the profit transfer between foreign related parties to countries with the lowest income tax rate. High transfer prices for sales of goods to affiliates in high-tax countries are used to repatriate profits to low-tax countries, thereby reducing the overall tax burden (Behrens, Peralt & Picard, 2014; Usmen, 2012). From a political perspective, concern about profit shifting to low-tax jurisdictions is growing due to increasing international tax rate differentials (Martini, Niemann & Simons, 2012). Transfer price taxation is a system that tries to protect the domestic tax authority and to prevent international tax evasion (Cho & Park, 2015). However, tax advantage might be gained as well by the profit transfer between

domestic related parties with the aim to decrease the income tax base of profitable company and tax loss carry forward in loss-making company (Kočiš, 2015).

Transfer pricing might be characterized as a manner for price determination of transactions performed by related parties so they equal to those in conditions of unrelated relationship. Unrelated parties under the influence of market commercial conditions act so that they naturally defend their own interest. A seller is interested in maximizing of his selling price (income) and a buyer is interested in minimizing his buying price (cost). In case of related parties the natural market regulator is not working. A buyer and a seller act in concert and follow the same economic interest. Therefore business relationships of related parties are individually reviewed in accounting and tax practice (Pastierik, 2015).

If prices in business relationships of related parties differentiate from prices used between unrelated parties in comparable business relationships, the related parties are obliged to adjust income tax base to a difference. Several methods of transfer pricing and their combinations are used for a difference determination while it is allowed to use only such a method which a use pursues the arm's length principle. The used method is declared by a related party by means of transfer pricing documentation (Karelová, 2015).

All the obligations as regards the transfer pricing were binding only to foreign related parties in the Slovak Republic till the end of financial year 2014. The amendment of the Act No. 595/2003 Coll. on Income Tax with the latest amendments has come into force since 1 January 2015. The amendment has brought the extension of transfer pricing rules to domestic related parties.

2. Data and Methods

The paper's aim is to assess the issue of transfer pricing in the Slovak Republic and to review the strengths and weaknesses of individual transfer pricing methods. The theoretical research has been applied for reaching the paper's aim.

Basic input materials are following legal norms except for professional literature:

- OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations,
- Act No. 595/2003 Coll. on Income Tax with the latest amendments (hereinafter referred to as “Income Tax Act”),
- Regulation of the Ministry of Finance of the Slovak Republic No. MF/011491/2015-724 on determination of documentation content pursuant to the Article 18 par. 1 of the Income Tax Act,
- Methodical instruction of Financial Directorate of the Slovak Republic to the application of transfer pricing methods.

Generally accepted basic research methods have been applied in the paper's processing which lead to the achievement of scientific knowledge in relation to the before mentioned issue.

3. Results and Discussion

3.1 Transfer pricing: Economic substance and legal arrangement

The arm's length principle has been anchored in legal norms of the Slovak Republic since its formation since the year 1993. However, the practical application of transfer pricing rules has been substantially limited by the tax authorities and taxpayers for a long time. The increased attention has been paid to transfer pricing since the year 2009, when the obligation of taxpayers to maintain a documentation of used transfer pricing method has been anchored. For the taxable

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period beginning 1 January 2009 the amended measure of Article 18 of the Income Tax Act was applied for the first time, as well as the first measure of the Ministry of Finance of the Slovak Republic No. MF/8288/2009-72 on documentation content of pricing method used by a taxpayer pursuant to the Article 18 par. 1 of the Income Tax Act. This has determined the basic legal range of transfer pricing regime in the Slovak Republic and therefore the presumptions for a practical application of internationally accepted principle of unrelated relationship have been created.

The first measure of the Ministry of finance of the Slovak Republic on documentation content of transfer pricing method has been substituted by the new measure of the Ministry of finance of the Slovak Republic No. MF/8120/2014-721 on determination of documentation content of pricing method used by a taxpayer pursuant to the Article 18 par. 1 of the Income Tax Act. The previously existed legal arrangement on documentation content of transfer pricing differentiated two basic forms of documentation, namely basic documentation for taxpayers reported profit or loss in individual financial statements pursuant to IFRS and simplified documentation for all other taxpayers. The basic change brought by a new measure is the classification of taxpayers to three groups according to predefined criteria and depending on it is the distinction of three documentation forms (basic, reduced and full documentation).

The further substantial change has been marked in the legal arrangements of transfer pricing since 1 January 2015 when the application of transfer pricing except for foreign related parties has been set up also to domestic related parties. In connection with the before mentioned the current rules on documentation content of transfer pricing have been adjusted by the new measure of the Ministry of Finance of the Slovak Republic No. MF/011491/2015-724 on determination of documentation content of pricing method used by a taxpayer pursuant to the Article 18 par. 1 of the Income Tax Act.

The new measure as well as the previous measure conceptually derives from the principles and fundamentals set up in the OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations. The directive on transfer pricing deals with the issue of transfer pricing from the international context. It is considered as the generally accepted additional expository means to the Article 9 of double taxation avoidance treaties pursuant to which the Slovak Republic is bound in accordance with the Vienna Convention on the Law of Treaties. The directive on transfer pricing deals with the definition of the arm's length principle and individual used methods of transfer pricing.

The arm's length principle presents the base of transfer pricing. It is defined in the Article 18 par. 1 of the Income Tax Act. It is based on the comparison of conditions set in business or financial relationships between related parties with the conditions which would be agreed between unrelated parties in comparable business or financial relationships under comparable circumstances. When comparing, mainly the activities are taken into account which are performed by comparable parties, i.e. production, installation works, research and development, purchase and sale, and the others. The subject of comparison is also the content of their business risks, the features of comparable property or service, agreed agreement conditions, economic environment of market, business strategy. Conditions are comparable if there is not the substantial difference between them or when the influence of such differences might be eliminated. The arm's length principle allows tax administrator to adjust the tax base of related party to a difference which occurs when the prices in transactions differentiate from the prices in comparable transactions between unrelated parties under comparable circumstances.

Related party is defined quite extensively by the Income Tax Act. Related party is a close person pursuant to the Civil Code, or economically, personally or another affiliated party. Economical or personal relationship means:

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1. a person's share in property, control or management of another person. The share in property or control means more than 25 % of direct or indirect share or indirect derived share in share capital or voting rights. If the amount of indirect derived share exceeds 50 %, all parties by means which the amount is calculated, are economically related regardless their real amount of share. The participation in management means the relationship of statutory members or members of supervisory board of commercial companies or cooperatives to this commercial company or cooperative.
2. the mutual relationship between parties which are under control or management of the same party or in which this party has direct or indirect share in property.

Pursuant to the Income Tax Act another relationship is defined as a business relationship created mainly for the purpose of tax base decrease or increase of tax loss.

The term "transaction" might be defined as a business or financial relationship between two or more parties. The subject of transfer pricing are transactions of related parties, marked as controlled transactions. The price is the subject of a controlled transaction, is marked as a transfer price. Transactions realized between unrelated/independent parties present unrelated transactions. Controlled transactions are compared with uncontrolled transactions while only those transactions might be compared which have all economically crucial comparable features. If a related party performs a comparable transaction with a related party as well as an unrelated party, an internal uncontrolled transaction shall be used for the comparison, i.e. transaction between related and unrelated party. If a related party performs a comparable transaction only with a related party, an external uncontrolled transaction shall be used for the comparison, i.e. transaction between unrelated parties.

3.2 Methods of transfer pricing

Methods of transfer pricing present the manner how to calculate a difference to which prices differentiate in the mutual business relationships between related parties from prices used between unrelated parties in comparable business relationships.

The Slovak Republic has adopted the methods of transfer pricing pursuant to the Directive on transfer pricing which are based on the comparison of price (traditional transaction methods) and the comparison of profit (transactional profit methods). The Income Tax Act allows the mutual combination of before mentioned methods, respectively allows the selection of another method which is not defined in the Income Tax Act and the Directive on transfer pricing. The condition is to use another method which shall be in conformity with the arm's length principle.

Such a method should be used in a particular case which is the most appropriate taking into account the particular transaction specifics. For the purpose of the most appropriate selection of transfer pricing the following criteria are taken into account:

- strengths and weaknesses of a selected method,
- appropriateness of a selected method in the context of the controlled transaction nature,
- availability of comparable independent information,
- comparison level between controlled and uncontrolled transactions including the adjustments levels indispensable for the elimination of differences between these transactions.

3.2.1 Traditional transaction methods

Traditional transaction methods derive from the price comparison of goods or services which are the subject of controlled transaction between related parties. The comparable uncontrolled price method, resale price method and cost plus method belong to these methods.

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a) The comparable uncontrolled price method derives from the price comparison of property or service agreed between related parties with the price of comparable property or service agreed between unrelated parties. For the application of this method the compliance of assessed property or service is inevitable and as well as a high level of comparability of agreement conditions, market and economic environment. This fact might be considered as a disadvantage of the method while in practice it is rather difficult to find a comparable uncontrolled transaction performed in comparable circumstances. The method advantage is its relative independence on the internal information system of an enterprise because transfer price is compared with a price which shall be confirmed in the market. The comparable uncontrolled price method is suitable to apply in transactions with tangible assets (e.g. raw materials), intangible assets (e.g. licence fees) and with financial transactions (e.g. interest rates).

b) The resale price method derives from the price at which a product that has been purchased from an associated enterprise is resold to an independent enterprise. This price (the resale price) is then reduced by an appropriate gross margin on this price (the "resale price margin") applied by other independent enterprises in comparable transactions. The condition of this method application is the conformity in performed functions and taken into accounts risks assumed of compared subjects. The method can be used in case that the reseller does not add any other margin to an asset, i.e. he resells the purchased products with any adjustment. Differences in products do not eliminate the application of this method because the product differences have a lower influence in margin than in price. The resale price method is used mainly in case of distributors.

c) The cost plus method derives from the real direct and indirect costs needed for property or rendering of services increased by a sum of price margin. Costs are increased by a price margin applied by the same supplier in transactions with independent enterprises or by a price margin which should be applied by an unrelated party in a comparable transaction under comparable circumstances. When applying this method it is necessary to pay attention to the costs comparability. The cost plus method is appropriate in transactions with subjects like production and sale of semi-finished products or finished products which do not include any added value.

3.2.2 Transactional profit methods

The transactional profit methods derive from the profit comparability arising from a controlled transaction. They comprise of transactional profit split method and transactional net margin method. The application of transactional profit methods is appropriate in case there is not a sufficiency of reliable data at disposal for the analysis of comparability in traditional transaction methods. The before mentioned methods are used in transactions where the subjects are unique products, services or intangible assets of high values (e.g. trademarks, business name).

a) The transactional profit split method derives from the split of assumed profit from controlled transactions expected by unrelated parties in an associated business and taking into account the arm's length principle. When applying this method it is indispensable to have at disposal the information on both contractual transaction parties. The condition of the transaction profit split method usage is the achievement of combined profit which shall be the subject of split. The distribution of combined profit can be realized on the base of allocation key (e.g. ration 20/80) or on the base of variable (e.g. the proportional part of incurred costs by one contractual transaction party to perform certain function, e.g. research and development, marketing, distribution). The usage of transaction profit split method is

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appropriate in highly integrated operations when contractual parties own valuable intangible assets or their contribution to transactions has a unique character.

b) The transactional net margin method determines the amount of profit margin in transactions between related parties in connection to set basis (e.g. costs, income) and compare it with the profit margin used in relation to unrelated parties. The method can be used only in individual transactions or several same transactions. If a related party performs more various types of transactions, it is essential to treat each transaction separately. The method usage is limited when the contractual parties own valuable intangible assets or contribute to transactions by a unique manner. Various indicators of profitability can be used in this method. It is crucial to confirm whether selected indicators provide reliable determination of taxpayer profitability and whether reliable data on comparable subjects are at disposal. The method advantage is that transactions are not compared on the base of absolute terms but on the base of relative characteristics.

Uniform rules do not exist when applying individual methods of transfer pricing which would be appropriate and applicable in each situation. The selection of particular method is the result of compromise while it is necessary to take into account a possible method inaccuracy, prioritize a higher level of comparability and a tighter relation to a transaction. The application of selected transfer pricing method shall be announced to a tax administrator by a taxpayer, while a taxpayer is obliged to demonstrate and justify the submission of transfer pricing documentation.

A taxpayer might ask a tax administrator for a decision on approval of a particular transfer pricing method before performing a transaction with a related party. Therefore a taxpayer can confirm whether his proposed procedure of transaction pricing is in accordance with the arm's length principle. The written request shall be filed at least 60 days before the beginning of a tax period in which the proposed transfer pricing method will be applied. Transfer pricing documentation shall be included in the request. The decision on approval of the transfer pricing method may be issued for up to five tax years.

3.3 Documentation on transfer pricing

In case of controlled transactions each related party is obliged to keep the documentation on used method of transfer pricing. The documentation presents the file of information, data and facts presenting and explaining the procedure of price creation in controlled transactions. The minimal range of documentation is limited by the Measure of the Ministry of Finance of the Slovak Republic No. MF/011491/2015-724 on determination of documentation content of pricing method used by a taxpayer pursuant to the Article 18 par. 1 of the Income Tax Act. From the point of required data range the following types of documentation is recognized: reduced, basic and full documentation. Each of the before mentioned documentation is fully determined for a precise group of taxpayers who are obliged to keep a particular documentation.

The obligation to keep the documentation on transfer pricing in range of full documentation relates to taxpayers who:

a) report the profit or loss in individual financial statements in accordance with the International Financial Reporting Standards (with some exceptions)
b) perform transactions with related parties who are taxpayers of non-contractual state (with exception of natural persons and taxpayers who are micro-accounting entities pursuant to the Act No. 431/2002 Coll. on Accounting with the latest amendments),
c) require the approval of transfer pricing method by a tax administrator,
d) deduct the tax loss exceeding the sum of 300 000 € from the tax base in a tax period,
e) deduct the tax loss exceeding 400 000 € from the tax base at least for two following tax periods (with some exceptions),

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f) apply the tax allowance in a tax period,
g) request the secondary adjustment of tax base in accordance with the international agreements.

Taxpayers natural persons and taxpayers who are micro-accounting entities pursuant to the Act No. 431/2002 Coll. on Accounting with the latest amendments (hereinafter referred to as "Accounting Act") keep the documentation minimally in range of reduced documentation. The possibility to keep the reduced documentation relates as well as to the selected subjects of public administration but only for some controlled transactions. The same is applied in case of transactions between domestic related parties, it is sufficient to keep the reduced documentation as regards domestic controlled transactions. The possibility to keep the documentation on domestic controlled transactions in reduced range is not provided to taxpayers who in accordance with the before mentioned points from c) to g) are obliged to keep the full documentation on transfer pricing. The possibility to keep the reduced documentation is assessed positively as regards the Articles of OECD Guideline on transfer pricing pursuant to which the interstate requirements on documentation content should not cause inappropriate burden to taxpayers.

The keeping of documentation in minimal range of basic documentation shall be for all other taxpayers who have not been mentioned before.

The documentation in the range of basic or full documentation is kept for transactions or groups of uniform transactions with the value over 1 000 000 € in a particular tax period or transactions which are crucial for a taxpayer. Pursuant to the Accounting act the crucial information is such for which a non-disclosure could affect the judgment or decision making of information users from the financial statements. The level of significance is individual for each taxpayer therefore in practice it is usually determined in the internal accounting directive. For other controlled transactions it is sufficient to keep the documentation in the reduced range.

The documentation is conducted for each controlled transaction separately or together for a group of uniform transactions. The documentation is kept for a particular tax period. If any essential changes have arisen, a taxpayer might refer to information determined in the documentation of the previous tax period.

4. Conclusion

The issue of transfer pricing presents the crucial area of legal arrangements of income tax and is the subject of dynamic development in the global but as well as in the national scale. Recently the transfer pricing has become the central theme for both tax administrators and taxpayers in the Slovak Republic. It relates to the fact that as at 1 January 2015 the principle of unrelated relationship has been applied not only to transactions between foreign related parties but also between domestic related parties.

The obligation of related parties is the adjustment of income tax base to a difference for which the price in the mutual transactions of related parties differentiate from prices used between unrelated parties in comparable transactions and under comparable circumstances. In order to determine the before mentioned difference various transfer pricing methods are used, which shall be kept in the documentation by taxpayers since the year 2009. Until the year 2009 the comparability analysis between related parties was problematic for taxpayers as well as for tax administrators performing a tax control. The obligation to keep the documentation on transfer pricing has simplified the work of tax administrators and has transferred the burden of transfer pricing proof to taxpayers.

During the last years the number of tax controls focused on the transfer pricing has been increased and therefore the professional skills of employees of financial administration have been increased as well. In the future the intensification of transfer pricing controls between domestic related parties can be expected, focusing particularly on those related parties that disclose the tax loss. We recommend taxpayers to report the widest possible range of information in transfer pricing documentation to demonstrate compliance with the arm's length principle to transactions between related parties despite the minimal range of information provided in the measure of the Ministry of Finance of the Slovak Republic on formalities of transfer pricing documentation.

Tax payers transfer their profit between related parties within the country or transfer the profit between related parties across borders to countries with more favourable tax regulations, in the economic literature marked as the so-called "stowaways". These subjects participate in the social consumption financed by collected taxes but they themselves do not contribute to them. Therefore the economic and tax policy of a state should ensure that taxpayers obtain legal and moral barriers to transfer the profit between related parties in order to acquire a tax advantage.

In several countries of CEE (the Slovak Republic, the Czech Republic, Poland, Hungary, Romania) the issue of transfer pricing is amended by particular legal arrangements related to the income tax. The rules of transfer pricing relate to foreign as well as domestic related parties in all before mentioned countries. In the Slovak Republic the obligation to evaluate transaction on the arm’s length principle referred only to foreign related parties till the end of 2014. Effective since 1 January 2015 the rules of transfer pricing has been spread also to domestic related parties. In the before mentioned countries including the Slovak Republic all taxpayers keep the transfer documentation as they perform transactions with domestic or foreign related parties. In Poland except for these subjects it relates to those taxpayers who perform transactions with so called tax havens.

In the selected countries of CEE the acceptable methods of transfer pricing are those pursuant to the OECD Guidelines. In the Slovak Republic and the Czech Republic the traditional transaction methods can be used as well as transactional profit methods of transfer pricing while the principle of the most advantageous method is applied. In Hungary and Poland the traditional transaction methods are preferred before the transactional profit methods. In Romania the uncontrolled price method is preferred and the selection of another method is required to be reasoned. Even in the Slovak Republic recently the usage of traditional transaction methods has been preferred before the transactional profit methods. This hierarchy in the application of transfer pricing methods has been eliminated by the amendment of the Income Tax Act effective since 1 January in accordance with the current version of the OECD Guidelines. In conclusion it can be stated that the Slovak Republic altogether with other selected countries of CEE respects the rules arising from the OECD Guidelines in the area of transfer pricing between related parties, while the concrete methods of application of the arm’s length principle and the obligation of keeping the documentation on transfer pricing are anchored in the particular legal arrangements as regard the income tax.

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SESSION 7

New dimensions in rural development and sustainable agriculture – in cooperation with the Slovak sociological society's section on rural and agricultural sociology

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The possibility of combining static and dynamic analyses through the example of the Börzsöny-Duna-Ipoly LAG area

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Abstract
In my study I attempt to unify place-based static and dynamic analyses with the help of a methodology to be able to investigate the resources and characteristics of a local area. The abovementioned methodology would be able to support monitoring activities and the analysis of the heterogeneity/homogeneity of a region.
The methodology is capable of ensuring a systematic approach, the exploration of local problems, the creation of an objective situation report based on a wide-ranged database and modern methodological processing necessary for strategy-making and the establishment of efficient development activities (by designating so-called hot-spots).
My aim is to create a methodology by using the experience of my investigations which is supported by and complies to the findings of previous literature in this topic, and which can be a useful tool for potential users. It is also crucial that it must give answers to the failures of previous methodologies and to provide ways to improve them.

Keywords: *dynamic analyses, static analyses, combination*

JEL Classification: *O18, O21, O41*

1. Introduction

Based on Káposzta (2014) „the main driver of regional disparities is the restructuring effects of socio-economic processes, and these factors become more and more significant in the globalised world. By gaining knowledge about processes resulting regional differences and their impact on the spatial structure we can improve the situation of lagging-behind areas. In this complicated state of relationships between regions primarily the development strategies based on endogenous resources and opportunities, the improvement of internal capital can lead to success". As Péli (2015) stated: the most significant development activities must be carried out in the centres, because only these 'core areas' can generate dynamic growth in their agglomeration areas, and in the ever expanding outer peripheries.

Establishing priority areas for development is even more important if considering the rural development policy of the European Union (EU) for the time period between 2014 and 2020, because it can provide a good opportunity for lagging-behind areas without strong secondary and tertiary sectors, well-developed infrastructure, basic services and jobs. However, although regional studies nowadays emphasise the importance of local development, the low development levels of some regions question the basis for such initiatives. (Ritter et.al, 2013) Káposzta and Nagy (2013) wrote the following lines: "By today, agriculture is not the only (however, still a significant) function of the rural areas, since rural economies are much more complex systems. Considering the development policy of the EU, aiming to ensure integration, the trends of its changes, we can observe that beside structural changes, the industrial development in rural areas, the improvement of the food economy and infrastructure, improving social situation and the expansion of rural tourism, environment is gaining more and more importance.

One of the most important changes brought about by the restructuring rural areas is that there are new kinds of jobs needed and some qualifications become devaluated. Therefore, lagging-behind peripheral settlements search for solutions for their employment and services problems through Local Economic Development (LED), but this process requires strong infrastructural endowment and local communities (Ritter, 2014). Kassai and Ritter (2011) stated that these two elements correlate strongly to the social and economic development level of the certain areas, which means they can be important factors of competitiveness and the results of endogenous development.

According to Goda and Tóth (2013) „the development of rural areas is an interdisciplinary science, which is based on many approaches, thanks to its complexity. These approaches usually have system-theoretical roots; however, it is a not a tool of regional development, but an approach to deal with development processes."

Due to the complexity of regional differences it is not advisable to conduct regional analysis based on only a few economic indicators. As Nagy and Káposzta (2006) stated that GDP calculation is not applicable for analysing region analyses below a certain spatial level, similary to Cypher-Dietz (2009), who wrote that measuring income differences is also not suitable for this type of analysis, since other factors also affect this process.

It is one of the basic problems of development that Hungarian and international strategic documents are methodologically lacking sometimes; for example, in the case of the Local Rural Development Strategy within the LEADER programme (which is the predecessor of the current Local Development Strategy, LDS). Despite the fact the requirements of the EU are getting ever stricter towards these documents, their quality shows significant fluctuation. Therefore, a complex system (methodology) is needed to solve this problem. The methodology this study presents (Regional Performance Analysis) uses static and dynamic indicators for a selected time period for the changes in development of a certain region. The basis of this methodology was a theory by Lendvay and Molnár (2013), who stated that "the goal of economic development activities of local governments is to change one or two external factors for the purpose of the settlement, or to adapt to the external endowments by changing internal factors". It means that economic development activity is a combination of natural and "artificial" development processes in a certain time period.

This system ensures a systematic approach, the investigation of local problems; also, it provides a new way to create an objective situation report based on databases and data processing for strategy generation; it enables its user to create a basis for monitoring economic activities and to designate hot spots for development.

2. Data and Methods

The methodology of the Regional Performance Analysis compares the characteristics of certain regions with other ones by a pre-defined criteria-system.

According to Péli (2013), two of the reasons behind spatial differences are the development trends of regions and the competition between them. This regional process is generated by the changes in natural resources, population, production, infrastructure, and their relationship in a country and in its regions. Based on this theory the pre-defined indicator systems contain 60 basic indicators, including 40 complex indicators along four dimensions, which are the local economic, the society, the environment and the infrastructure.

Performance analysis – based on indicator groups related to the abovementioned four dimensions – measures a region in two ways. First, its natural development level – dynamic

analysis –, in which the changes of the region are investigated in a specific time period (in this case, between 2007 and 2013). The next step is the analysis of the 'artificial' development level – static analysis – in which the situation of the region is investigated in every year of the abovementioned time period, separately. Then, the performance of certain units of the region is compared to a larger selected spatial unit's, and it is evaluated by a pre-defined criteria-system. After that, by taking the average value of the indicators it describes the performance of the region on indicator, dimension and index levels.

In the author's opinion certain development hot spots can also be defined. It means that those areas will be discovered which need development, and those strengths are also identified, which the development activities can be based upon. Also, it provides opportunity to investigated indicators and dimensions in a smaller and in a larger region as well.

To test the methodology the action area of the Börzsöny - Duna - Ipoly Rural Development Organisation (BDIVE) was selected, due to the fact the author has strong ties to that area and also because of certain problems found in the LDS of the area.

The total population number of the area is 24,411, which is the same as the number of people included in the LEADER programme of the area. The area is geographically homogenous strangely because of its natural diversity. From the 17 in the selected area 10 lie close to the Slovakian border, where the river Ipoly serves as a natural border. Five other settlements are situated on the left side of the Danube. The majority of the test area belongs to the Duna-Ipoly National Park, which has a significant impact of the local land use structure.

There are many common characteristics found among the settlements of the selected area. The most significant – which is almost generally true in Hungary – is population loss, cause mainly by the aging population and out-migration (the only exception is Kismaros in the area). The administrative regional border changes in the past and the cultural diversity cause by the fact that the region is close to the border results low social coherence. On the other hand, local traditions may help developing common identity. Economic processes are also affected by unfavourable social indicators as well. The lack in population in working age causes a low rate of employed people in the majority of the settlements, and long-term unemployment is high among people above the age of 45. From the branches of agricultural – due to the natural endowments – forestry, game- and water management are the most common land use types.

3. Results and Discussion

On the right side of Table 1 we can see the classification of the Regional Performance Analysis, which contain 7 categories on a scale from -3 to 3 in the current study. On the left side the dimension and index level results can be observed. The action area belongs to the *lagging-behind* category on index level (TT), based on the calculation; on dimension level the society stagnates, the local economy and the infrastructure *lag behind*, the environmental dimension is *failing*. On settlement level the result of the performance analysis is the following: 1 town (Verőce) stagnates, there are 5 lagging-behind and 11 failing settlements. These results seem very low, due to the fact that they were compared to the results of Pest county, and it is well-known that the action area is the least developed in the county.

On the map based on the data of Table 1 (Figure 1) these results can be observed much easier, then in the table. From the dimension level analysis of some settlements we can see that, in spite of the area was compared to Pest county, they show developing trends (marked with the colour green in the cells of Table 1) in some dimensions. These are the hot spots, which can support settlement development; for example, in the case of Verőce, the local economy and

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society pillars could provide the most positive external opportunities for the region. On the other hand, in Tésa and Szokolya the hot spots only bear negative external opportunities, which means that the opportunities must come from the weaknesses, for which external resources will be needed.

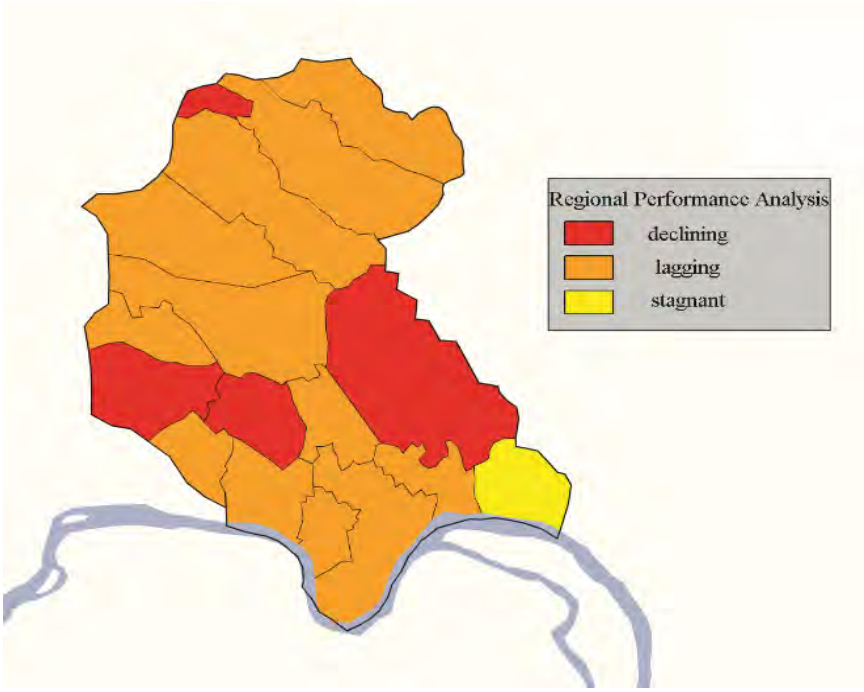
Table 1: The result and the classification of the Regional Performance Analysis

	Local economy - RPA	Society - RPA	Environment - RPA	Infrastructure - RPA	Regional Performance Analysis
Bernecebaráti	-0,51	-0,03	-1,02	-0,21	-0,43
Ipolydamásd	0,16	-0,47	-1,54	-0,30	-0,49
Ipolytölgyes	-0,06	-0,07	-0,64	-0,54	-0,31
Kemence	-0,15	-0,07	-1,28	-0,18	-0,39
Kismaros	-0,72	0,42	-1,04	-0,69	-0,50
Kóspallag	0,00	-0,33	-0,99	-0,57	-0,45
Letkés	-0,84	-0,19	-0,86	-0,37	-0,57
Márianosztra	-1,21	-0,13	-0,85	-0,43	-0,66
Nagybörzsöny	-0,01	-0,03	-1,51	-0,56	-0,49
Nagymaros	-0,04	0,13	-1,02	-0,28	-0,28
Perőcsény	-0,38	-0,16	-1,13	-0,14	-0,43
Szob	-0,57	0,10	-0,32	-0,06	-0,22
Szokolya	-0,76	-0,33	-0,67	-0,95	-0,68
Tésa	-0,49	-0,66	-0,83	-0,94	-0,72
Vámosmikola	-0,08	0,07	-1,36	-0,15	-0,35
Veröce	0,22	0,20	-0,74	-0,11	-0,08
Zebegény	0,15	0,02	-0,92	-0,20	-0,21
Börzsöny-Duna-Ipoly	-0,31	-0,09	-0,98	-0,39	-0,43

Classification			
Sorting			Name
1,5	<=	3	intensively developing
0,5	<=	1,5	developing
0,15	<=	0,5	began developing
-0,15	<=	0,15	stagnant
-0,5	<=	-0,15	lagging
-1,5	<=	-0,5	declining
-3	<=	-1,5	more declining

Source: The author's own editing

Figure 1: The results of the Regional Performance Analysis on a map



Source: The author's own editing by using the Online Geomarket GIS application, 2016

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Table 2. demonstrates how the action area performs on an indicator level (this was calculated for settlement level as well, but due to page restrictions that could not be included in this study). The table shows that in the investigated time period the catering industry, unemployment rate and other social indicators of the regions improved (light blue cells). But we can also see that natural propagation, population density and the rate of selective waste collection are weak points of the region, and they are failing compared to other regional trends (dark red cells). Further weaknesses (red cells) are the some parts of the business sector and infrastructure, and almost the all the environmental results.

Table 2: Indicator level results (and the elements of the indicator system)

Local economy											
The proportion of businesses operating within the registered ones	Number of retail stores per capita in 1000	Gross value added per capita	Revenue from small-scale agriculture per 1000 inhabitants	The relative income per one inhabitant of working age	Number of commercial accommodations per capita in 1000	Number of catering establishments per 1000 inhabitants	The number of guest nights per guest in one of the commercial and non-commercial accommodation	Number of non-commercial accommodations per capita in 1000n	The number of subsidies payed within the frame of the 1., 3. and 4. axes of the EAFRD	The amount of local taxes per capita	
-1,46	-1,03	-0,31	-0,98	-0,69	-1,16	1,39	0,27	1,10	-0,31	-0,24	-0,31
	Society										
	Net migration per 1,000 persons	Natural increase per 1,000 persons	Population density	Aging index	Dependency index	Relative economic activity (%)	The relative ratio of registered unemployed	The relative indicator of the registered people unemployed for more than 180 days	Regular social assistance amount used per 1000 inhabitants	Participating in cultural events per 1000 inhabitants	
	0,53	-1,75	-1,74	0,41	-0,51	0,46	0,76	0,76	-0,02	0,20	-0,09
		Environment									
		The amount of municipal solid waste shipped from the inhabitants	The generated amount of hazardous waste	The proportion of homes involved in regular waste collection	The rate of households involved in selective waste collection	The proportion of recycled municipal solid waste	The primary utility gap	The amount of support payments related to environmental actions per 1000 people	Fines, penalties and other special revenue of the Local Government related to local taxes	The volume of wood per 1 hectare	
		-0,79	-1,26	0,22	-2,82	-0,98	-0,89	-0,98	-0,74	-0,62	-0,98
	Infrastructure										
	Average distance in time to the micro-regional centers	Secondary utility gap	The rate of domestic gas consumers	The rate of household electricity consumers	The number of passenger cars per 1,000 persons	The number of patients per one family doctor	The number of social catering recipients per 1000 inhabitants	Average student numbers in primary schools	The rate of public spaces and roads built by the Local Government	The rate of sidewalks built by the Local Government	
	-1,36	-0,92	-0,32	-0,85	0,35	-0,60	0,74	-0,92	-0,06	0,00	-0,39
										Börzsöny-Duna-Ipoly	-0,43

Source: The author's own editing

Local economy (Figure 2) is a lagging-behind dimension of the region, but on settlement level we can see that many settlements have started a developing trend. It was observed that economy started to decrease around almost all of the settlements. This is probably because of the fact that developing settlements have a stronger attraction power, which the smaller

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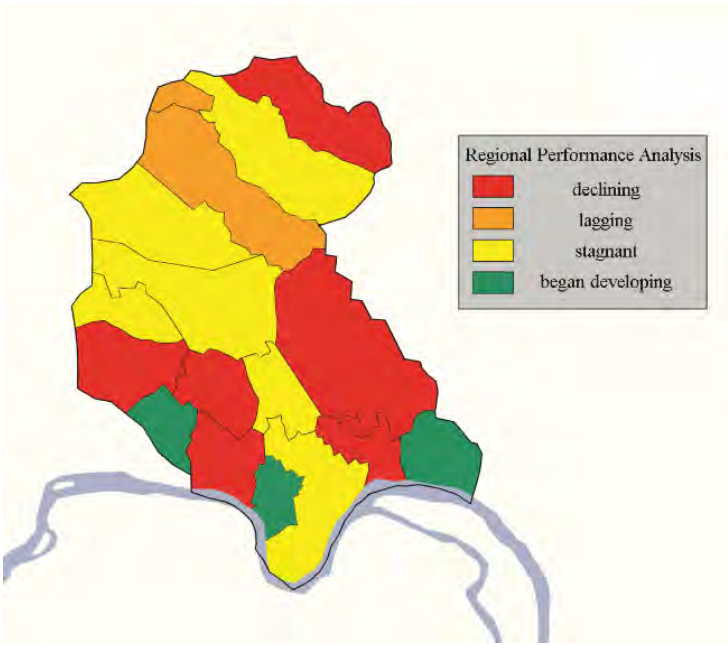
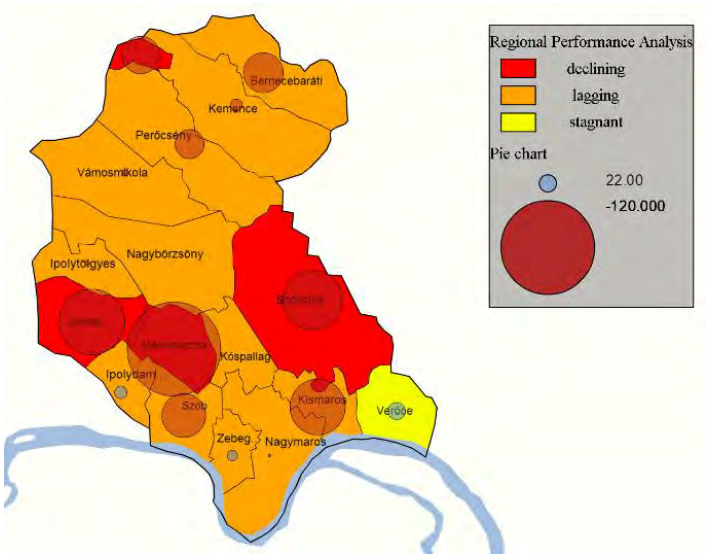
settlements could not do anything in the seven years observed; therefore, those economies started to fall back.

Figure 2: The map of the local economy dimension of the Regional Performance Analysis



Source: The author's own editing by using the Online Geomarket GIS application, 2016

Figure 3: The map of the Regional Performance Analysis and the pie chart of the local economy dimension



Source: The author's own editing by using the Online Geomarket GIS application, 2016

Thanks to the GeoMarket GIS programme used for the investigation it was possible to generate maps and charts based on the results of the analyses. On Figure 3 we can see that in the case of the local economy, that, despite many settlements have started to improve their situation, these results is not enough to balance out the decrease in the economy of the other settlements. Therefore, the BDIVE area will belong to the *lagging-behind* category, based on the Regional Performance Analysis.

The stagnating position of the social dimension can be understood better if we try to analyse the pie chart below (Figure 4.). It can be observed that the differences are lower between the

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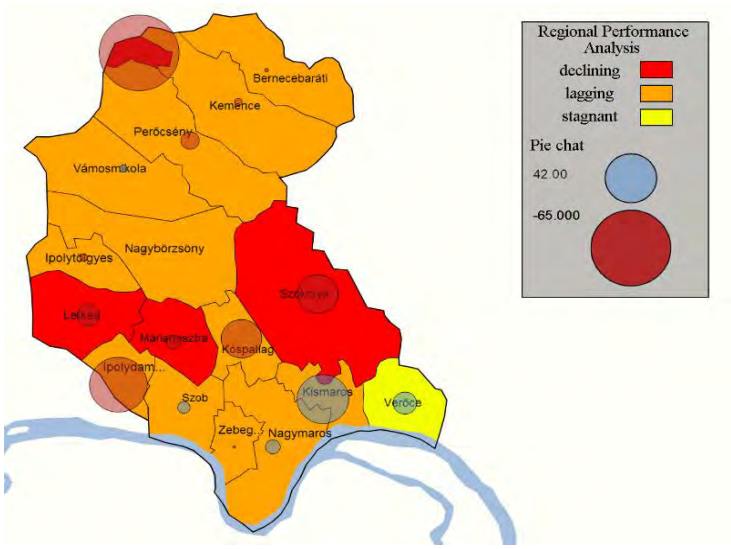
lowest and highest values. But it is also demonstrated that the results were generally better in the South than in the North, which is caused by the fact that the Southern areas have much better endowments supporting the development of the society.

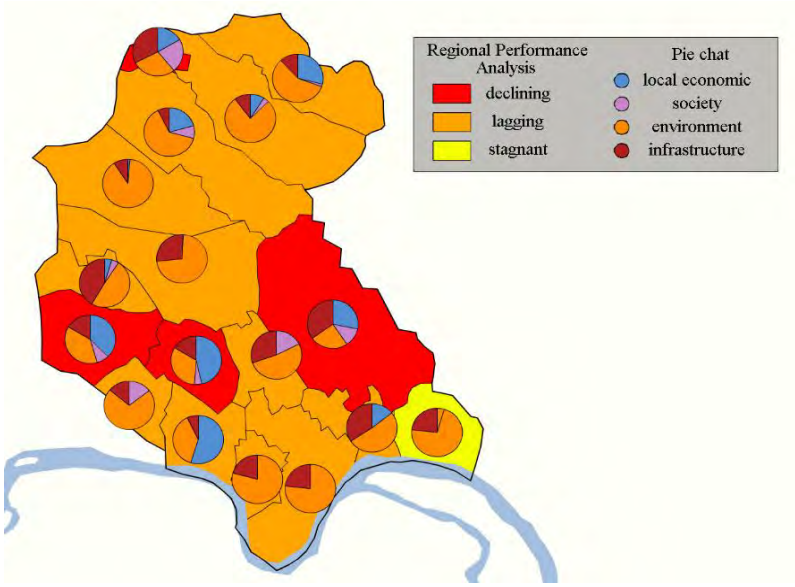
Figure 4: The map of the Regional Performance Analysis and the pie chart for the social dimension



Source: The author's own editing by using the Online Geomarket GIS application, 2016

Finally, on Figure 5 we can see that on settlement level the results of the Regional Performance Analysis are determined by environment, followed by the infrastructure and the local economy.

Figure 5: The map of the Regional Performance Analysis and the pie chart showing the rate how much certain dimensions affect the results of the analysis



Source: The author's own editing by using the Online Geomarket GIS application, 2016

4. Conclusions

This study was intended to be the first step of designing a new methodology for creating a basis for development plans. The methodology still needs improvement: the finalisation of the

complex methodology and the presentation of the full array of results will be the subjects of a later study.

Since the index can be derived to all of its element, including the levels of dimensions and indicators, as well as to static and dynamic analyses, we can see that which are the specific local characteristics, strengths and weaknesses. Also, we can see that which regions perform better or weaker. By learning these we can find those development nodes/hot spots (which can be either characteristics or geographical areas) which are necessary to develop, or on which later development can based on.

The Regional Performance Analysis has a huge potential to describe reality through static and dynamic investigation of development, which includes the comparison of the performance of certain areas and the region which contains the specific area in a time period chosen by the researcher. Thanks to that, we can investigate economic, global and social processes, as well as the impact of development funds in the areas. It means that it allows its users to analyse the negative effects of the abovementioned processes, as well as the opportunities they may provide.

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Managing sustainable development of agriculture – case of Poland

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Abstract
Integration of activities serving for environmental protection and achievement of economic and social objectives is among the most important measures in agricultural policy. This paper presents an example of implementation of the concept of sustainable development of agriculture in Poland. A review of measures related to management of agricultural development at the national level was conducted, and sustainability of farms depending on specialization was assessed. Analyses pertain to 2013. Conducted analysis indicates that the factor with the greatest impact on the sustainability of farms is the production profile. In specialized farms, the economic objective is prioritized, often at the expense of the environment. Animal production poses a particular threat to the environment, which is the result of the concentration and large scale of production. Simplification of plant production occurred in farms specializing in field crops and swine. This is also an unfavorable practice, because it leads to disruption of the ecological equilibrium of agrocenoses.
Economic sustainability was achieved by farms conducting intensive production, and this occurred thanks to the large contribution of funds from the EU budget.

Keywords: *agriculture, farm, management, sustainable development*

JEL Classification: *Q18*

1. Introduction

In the concept of sustainable development, a need to integrate measures oriented towards searching for solutions intended to conserve the features of the natural environment while allowing for the achievement of economic objectives is emphasized. The need to implement such a model of development is a response to problems arising from industrial development related to loss of the natural character of agriculture. Changing consumer requirements and growing technological capabilities have led to industrialization of agricultural production methods. This is not neutral to the natural environment, which is burdened with all the consequences of this path of development. In effect, the technical and economic efficiency of production is increased, but this also leads to a series of unfavorable phenomena, such as deterioration of the well-being of animals or threats to the natural environment. Management of agricultural development should therefore account for measures integrating preservation of the natural environment while simultaneously allowing for achievement of economic objectives. Lichtfouse et al. (2009) postulate cooperation between scientists in different disciplines in order to develop new, environment-friendly agricultural practices.

Sustainable development of rural areas has become one of the important tasks of the EU's Common Agricultural Policy, which is reflected in the financial policy for the years 2014-2020. Public funds allocated for supporting sustainable development are an expression of this. These matters are regulated by Regulation (EC) No. 1698/2005. According to this regulation, rural development policy should be accompanied by a policy of supporting income, improvement of the condition of the natural environment and improvement of quality of life in rural areas.

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Realization of sustainable development is the subject of research on a global scale (Borys, 2005) and on the level of an individual farm (Harasim, 2013; Koloszko-Chomentowska, Wiater and Zukovskis 2015; Mańko, Sas and Sobczyński 2006; Wrzaszcz, 2012).

Ecological aspects are emphasized, above all, in research concerning the global level. However, experience in research indicates that agro-ecological assessment indicators at the national level cannot always be transposed to the regional level (Desjeux et.al. 2015), which is why there is a need to adjust indicator to the specific scale and subject of assessment. Ecological, economic and social aspects are all important in sustainability assessment, and they are more frequently applied at the level of an individual farm.

The specialization of farms is an important matter in sustainability assessment. The selected production profile and applied technologies have varying impact on the environment. These interactions have been confirmed by studies (Castoldi and Bechini, 2010; Kuś and Jończyk, 2010; Escribano et al., 2014; Koloszko-Chomentowska, Zukovskis and Gargasas 2015). The technological, biological, and organizational progress that is now taking place provides access to increasingly modern and effective technologies. However, this causes interference in the natural environment, and the manifestations of this interference include the disappearance of many plant and animal species and even deformation or loss of the natural rural landscape.

Achievement of sustainable development of agriculture and rural areas is an integral part of the general concept of sustainable development of a country, knowledge-based development. Such a system of management requires knowledge on the subject of the codependencies between human economic activity and the environment. Those working with the environment are deadline with living nature, which has a significant impact on other means of production. This is also significant from the perspective of development of the entire economy, since care for sustainable development of agricultural contributes to socioeconomic changes in rural areas and full realization of the economic potential of such areas.

Management of agricultural development takes place on two, strictly linked levels. The first is agricultural policy, mainly including implementation of agricultural support programmes financed by public funds (from the EU budget and partially from the national budget). Reception of public subsidies is dependent on a farmer's adherence to the principles of environmental protection. An agricultural, environmental and climate measure is implemented in RDP (Rural Development Programme) 2014-2020. The essence of this measure is to promote practices serving for protection of all elements of nature. It is a continuation of measures taken within the framework of the Agri-environment programme of RDP 2007-2013. Funds received within the framework of the RDP increase income and stimulate demand for investment and consumption.

The second level is implementation of measures at the level of an individual farm, and these measures arise from the development policy accepted at the national level. Farm owners are responsible for implementing these measures. It is they who bear full responsibility for manufacturing high-quality goods and applying technologies in adherence to the principles of protection of natural resources.

The need to conduct studies at different levels results from varying conditions, conditions vary between individual farms and the entire agricultural sector. The specific habitat, economic and organizational conditions of agriculture also have an impact on sustainability assessment, and equilibrium states change under the influence of many factors. This variability of conditions justifies the need for systematic research in this scope.

The objective of this paper was to review measures related to management of agricultural development at the national level as well as to assess sustainable development at the level of an individual farm depending on its specialization, using Polish agriculture as an example.

2. Data and Methods

The review of measures related to support for sustainable development of agriculture was conducted on the basis of studies by other authors and ARMA (Agency for Restructuring and Modernisation of Agriculture) data on payments made within the framework of support for practices protecting the environment. This mainly pertains to funds from RDP 2007-2013 but also to other payments, the reception of which is conditioned by adherence to environmental protection principles. Some economic instruments do not stimulate growth of agricultural production by assumption, but since they have the form of transfers to agricultural holdings, they have an impact on agricultural income as a result. This is inscribed into the concept of sustainable development, because aims pertaining to economic areas of sustainability include achievement of an income which provides farmers with a fair life standard (Lawn, 2003; Liu, 2010).

The second part of research was based on assessment of the level of sustainable development of farms with different production profiles on the basis of FADN data. The assortment of indicators for assessment of environmental sustainability is rather diverse (Belanger et al. 2012, Harasim 2013, Lebaco, Barent and Stihmant 2013). In the case of generally available FADN data, it is only possible to calculate some of them, namely: share of cereals in agricultural land (%) and stocking density ($LU \cdot ha^{-1}$). Agriecological assessment was supplemented by material pressure indices characterizing the burden on the environment caused by production resources (Piekut and Machnacki, 2011). These are: indirect consumption, value of mineral fertilizers and plant protection products, value of purchased feed, and energy consumption. These indices indicate the intensity of agricultural management. The total net added value per fully employed person (SE415/SE010) and the value of family farm income per fully employed family member (SE430=SE420/SE015), were accounted for in economic sustainability assessment. Profitability of labor was corrected by the balance of subsidies and taxes (SE600) to provide a complete picture of the economic situation of agricultural holdings. All values are given in PLN and EUR. Conversion to EUR was carried out according to the exchange rate used during charging of subsidies by the Agency for Restructuring and Modernization of Agriculture.

According to the accepted objective of research, the following farm types taken into consideration: field crops, dairy cattle, grazing livestock and pigs. These are the most common profiles of agricultural production in Poland. The analysis pertains to 2013.

3. Results and Discussion

RDP 2007-2013 was the largest programme of subsidies for the agricultural and food sector in Poland. PLN 71.4 billion were paid out within the framework of this programme in the years 2007-2013. The majority of funds were allocated to economic initiatives (51%), but nearly 18% of this amount was allocated to so-called restorative economic initiatives, which included measures intended to restore or preserve the condition of the natural environment and of resources indispensable for farming. RDP 2007-2013 was implemented on 4 axes, of which one (axis 2) entirely covered measures related to improvement of the natural environment and rural areas. Within the framework of measures financed on axis 2, the most funds were transferred to farms for conduct of agricultural activity in areas with unfavorable conditions, amounting to

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57.5% (Tab. 1). The Agri-environment programme, for which 36.6% of funds were expended, also enjoyed much interest from farmers. Other programmes had a lesser share in funds, but from the perspective of protection of natural resources, these were measures of great significance to their protection. Moreover, subsidies are paid directly to approx. 1.4 million farmers every year, and reception of these subsidies is dependent on maintenance of land according to good agricultural practice and fulfillment of conditions in the scope of environmental protection. PLN 122 billion in such subsidies were paid out in the years 2004-2014. All of these measures are oriented towards sustainable development of agriculture and rural areas.

Such initiatives are very important not just for the rural population but for society as a whole. According to studies, funds from RDP directed to rural areas in the years 2007-2013 contributed to growth of GDP by 0.61% on average in current prices and 0.32% in fixed prices (Zaleski, 2015).

Table 1: Allocation of funds within the framework of RDP 2007-2013 (axis 2)

Specification	Number of contracts	Payments 2007-2013 (thousand PLN)
Supporting agricultural activity in areas less favored areas (LFA)	5 857 216	10 891 211.4
Afforestation of agricultural and non-agricultural land	2 111	566 985.0
Agri-environmental program	566 626	6936 899.8
Restoring forestry potential	434	547 042.5
Together	6 426 387	18 942 138.7

Source: own calculation based on Agency for Restructuring and Modernization of Agriculture data

Management of sustainable development at the level of an individual farm is based on assessment of organization of production according to the principles of good agricultural practice. The basic determinant of organization of plant production is the crop structure, which, besides the level of fertilization, is decisive to the effects of farming. In general, the crop structure is adapted to the production profile. The data presented in Table 2 confirm this. In field crop farms, the share of cereals in the crop structure amounted to over 92%. The name of the production profile, by itself, indicates that cereals are dominant here. This indicator was similarly high in farms specializing in pigs (84.56%). This crop structure is characteristic of farms of this type. Production of pigs for slaughter is primarily based on purchased nutritive fodder. This is confirmed by fodder purchasing data. In such a case, the organization of a farm is based on simplification of plant production, which is unfavorable from the perspective of environmental impact, because it disrupts the ecological equilibrium of agrocenoses.

In dairy cattle farms, the share of cereals in the crop structure amounted to slightly over 35% and did not exceed 30% in grazing livestock farms. In this case, we are dealing with production in which green fodder is the basis of feeding animals. There is a large area of permanent grasslands, which are the natural feed base for ruminants, in farms with such production profiles. Furthermore, these farms cultivate large quantities of corn for green fodder, which is used to feed animals. This results in lesser demand for cereals.
According to the principles of good agricultural practice, the share of cereals in the crop structure should not exceed 66% (Duer, Fotyma and Madej 2002). From this perspective, only dairy cattle and grazing livestock farms met these requirements.

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Table 2: Agro-ecological assessment indicators (2013)

Specification	Field crop	Dairy cattle	Grazing livestock	Pigs
Share of cereals in crops (%)	92.61	35.14	29.89	84.56
Stocking density (LU·ha^{-1})	0.26	1.76	1.02	0.59
Total intermediate consumption (PLN·ha^{-1})	3996.25	3949.52	2256.72	9922.21
Mineral fertilizers (PLN·ha^{-1})	1200.44	475.71	244.35	664.17
Plant protection products (PLN·ha^{-1})	526.40	90.19	52.82	241.62
Value of purchased feed (PLN·ha^{-1})	201.57	1645.00	799.15	6781.03
Energy consumption (PLN·ha^{-1})	727.68	589.76	399.26	724.71

Source: own calculation

Organization of livestock production is assessed from the perspective of use of produced manure. The number of animals on a holding and their stocking density are both important. Average stocking density in the studied farms did not pose a threat to the environment, since the maximum limit of 1.5 LU·ha^{-1} (Duer, Fotyma and Madej 2002) was not exceeded. Dairy cattle farms were the exception, in which average stocking density amounted to 1.76 LU·ha^{-1} , and there are threats to the environment in relation to this. These threats result from high livestock concentration in the herd.

Total intermediate consumption per 1 ha of farmland is a general indicator of material pressure on the environment. It encompasses direct costs and general holding costs related to the operations of the agricultural holding. Pigs farms were characterized by the greatest intensity of production. The costs of purchasing fodder were the primary reason for this. The average value of the total intermediate consumption in this group amounted to PLN 9922.21 (EUR 2346.34) per 1 ha of farmland, and this was 2.5 times more than in field crop and fairy cattle farms and over four times more than in grazing livestock farms. Field crop farms used more mineral fertilizers and plant protection products, while dairy cattle farms used a relatively large amount of purchased fodders. The index of costs sustained for purchasing mineral fertilizers and plant protection products is of limited value in the assessment of farm sustainability, however it can serve as a criterion in assessment of trends occurring under given conditions (Sobczyński 2008). It is accepted that the greater the value of total intermediate consumption, the greater the pressure exerted by farms on the environment. Considering the extent to which technology provides means of production, pigs farms should be considered as having the strongest impact on the natural environment.

Farms with high production intensity achieve the most favorable results in economic sustainability assessment. The level of income depends on the value of production and costs incurred. Pigs farms sustained the highest costs, achieved production of the greatest value, and generated the highest income (Tab. 3). This is also confirmed by statistical analysis (Fig.1). The dependence between work productivity (net added value per fully employed person) and the value of income from family farm per fully employed family member was high and amounted to $R^2 = 0.959$. However, this dependence is not always obvios due to the convolution of various economic factors, and it my happen, that high profitability does not always accompany high productivity.

It should be noted that achievement of this level of income was possible thanks to subsidies. The share of subsidies in the income of a family-owned farm amounted to 35.9% in pigs farms

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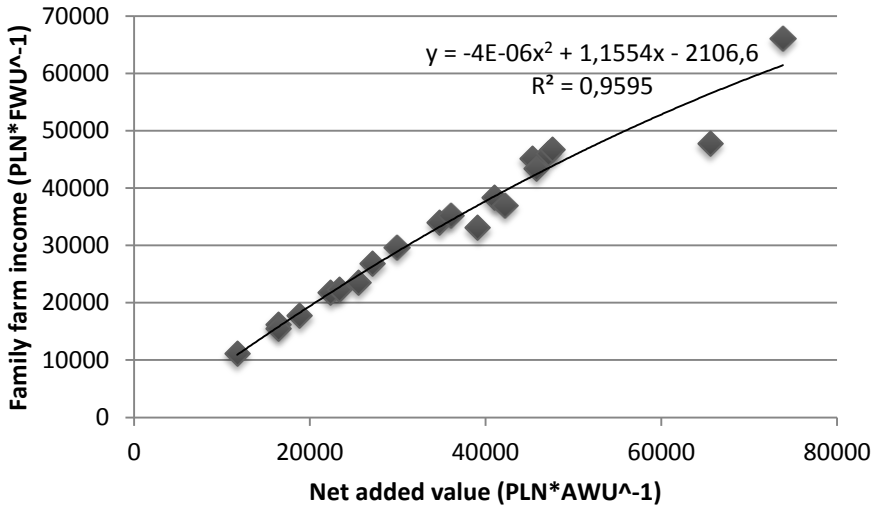
and to 73.6% in farms specializing in field crops. Grazing livestock farms had the least favorable results. Despite subsidies, the income of a farm per family member working full time was negative and amounted to PLN -1028 (EUR -243).

Table 3: Financial results – economic assessment indicators (2013)

Specification	Field crop	Dairy cattle	Grazing livestock	Pigs
Net value added (PLN·AWU^{-1})	39 111	36 088	16 433	45 806
Net value added (EUR·AWU^{-1})	9 249	8 534	3 886	10 832
Family farm income (PLN·ha^{-1})	2 365	2 950	1 282	3 416
Family farm income (EUR·ha^{-1})	559	698	303	808
Family farm income (PLN·FWU^{-1})	33 083	35 225	15 529	43 387
Family farm income (EUR·FWU^{-1})	7 823	8 330	3 672	10 260
Family farm income corrected (PLN·FWU^{-1})	9 585	20 374	-1 028	28 794
Family farm income corrected (EUR·FWU^{-1})	2 266	4 818	-243	6 809

Source: own calculation

Figure 1: Dependence between work productivity and family farm income
Source: own calculation



4. Conclusion

Sustainable development is a concept that is currently being promoted around the world. Only this model of development provides a chance to conserve the natural environment for future generations. Agriculture is considered to be of special importance in the concept of such development. Integration of activities oriented towards searching for solutions serving for environmental protection and achievement of economic and social objectives is among the most important measures in agricultural policy. This is also reflected in measures taken by the EU in the context of agriculture and rural areas. Management at the national level is based on creating a legal framework to provide a basis for supporting and executing measures protecting the natural environment. Experience gained until now shows that public funds directed to the

agricultural sector within the framework of RDP 2007-2013 not only improved the status of the natural environment but also contributed to growth of the GDP.

The owner of a farm is responsible for managing its sustainable development. When organizing the production process, a farmer should account for the consequences of implementing technology. A farmer is currently subsidized not only based on how much he or she produces but also based on the methods the farmer employs and on whether the farmer takes care of the natural environment, particularly since reception of subsidies is dependent on adherence to the principles of good agricultural practice.

Conducted analysis of sustainable development at the level of an individual farm indicates that the factor with the greatest impact on the sustainability of farms is the production profile. In specialized farms, the economic objective is prioritized, often at the expense of the environment. Animal production poses a particular threat to the environment, which is the result of the concentration and large scale of production. Simplification of plant production occurs in farms specializing in field crops and pigs. This is an unfavorable practice from the perspective of environmental protection, because in such situations, we are generally dealing with disruption of the ecological equilibrium of agrocenoses.

Financial support of farms with public funds has contributed to improving their economic situation. The share of subsidies in the income of a family-owned farm is particularly distinct. In many farms, income consisted solely of subsidies, and without them, the financial result would have been negative. Therefore, there is a low dependence between the income of a farm and labor efficiency.

To sum up, it should be noted that integration of economic and ecological objectives is rather difficult. Measures undertaken both at the national level and at the level of an individual farm provide great opportunities for making the concept of sustainable development of agriculture a reality. This will still require some time.

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The role of the agriculture in the Southern Great Plain

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Abstract
The examination of the past, the present and the future opportunities of Hungarian agriculture is an endless topic. The designation opportunities could be influenced by several factors worldwide, so that is the situation in the case of Hungary as well. Beside the natural factors (climate, soil, topography, hydrography) the economical endowments (employment, market conditions, supply, demand, material and labour supply, ownership and subsidies) are important too. In my research I try to explore the basic changes in the landuse and the importance of agriculture by varied datum and maps of agricultural enterprises in the case of South-Great-Plain region.

Keywords: *agriculture, changes, Southern Great Plain region*

JEL Classification: *O13, O18, Q100*

1. Introduction

The Southern Great Plain is the largest region of the country which is located on the southern-southeastern area of Hungary. The constituent counties of the region are Bács-Kiskun, Békés and Csongrád. The most of the region's territory makes up by plain with great scenery and natural value endowments. The elevation of the region doesn't exceed 200 meters nowhere. The area of the region is 18 339 km^2 that is the 20% of the country's area. The country's populations' 14% lives here, the population density is 74 capita/km^2. The greater part of the Sothern Great Plain is suitable for agricultural utilization, 85% of it is cropped and cultivated area. There are three operating National Parks in the region called Körös-Maros National Park, Kiskunsági National Park and Duna-Dráva National Park. The number of the landscape protection areas is 8 and 14% of nature reserve areas are found in the region (Southern Great Plain Operational Programme, 2007).

Considering the number of the settlements (254 which is the lowest value inside a region) and the area of the region (the largest region of the country) the Southern Great Plain has the rarest settlement-network in Hungary. In this kind of settlement-network the presence of differentiating farms is typical. These farms are meaning an important part of the settlements thus the separated development is inconceivable (Review of the Southern Great Plain Regional Development Conception, Proposals of Operational Programme, 2005).

Based on the natural endowments of the region (chernozems - the best capability soils – are the most common soils in the Southern Great Plain areas and the quality of the arable land is the highest in country) it is a traditionally agricultural territory. That statement was confirmed by several analysis, research and study. The datum from previous years of Hungarian Central Statistical Office and the various development conceptions were consolidated the role of the region in the agricultural production. Despite of the decadency of the regional competitiveness indicators between 1990 and 2007 the key part of the agricultural regions have remained (Southern Great Plain Agricultural Structure and Rural Development Programme, 1999).

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The rate of the gross value added produced in the agriculture and the aggregated value added does only exceed 10% in the Southern Great Plain by the end of 2000's. More than a quarter of gross value added produced by agriculture is provided by the Southern Great Plain. Bács-Kiskun, Békés and Csongrád counties give the third of the agricultural production of Hungary. If we are looking at the production of agricultural enterprises and individual farmers the region is still on the top. The agriculture's share from the investments is approximately 7% against the national average (3%). It shares in the food production almost 20% and it gives the 40% of meat production. Considering the size of the agricultural areas, the pig-breeding, the fisheries management and hunting the region is on the top of the list. Compared to the other areas of the country, the appearance of fragmented estates are less typical (Central Statistical Office, 2008).

Thanks to the intensive agricultural production the number of the individual farmers (out of the Northern Great Plain) is the highest (40%) in the examined region. 30% of agricultural enterprises are operating in the Southern Great Plain. In the case of enterprises the number of those who employ less than 10 people is the lowest while the number of those who employ more than 250 people is the highest (based on Central Statistical Office data, 2010).

Although the number of the livestock farming and plant breeding enterprises were decreased the relation (rate) between the two categories is the most balanced in the Southern Great Plain. Probably this was caused by the decrease of the crop production and the increase of the livestock farming (in 2007 the region was in the top in cattle- and sheep breeding). Almost the half of the vegetable cultivating farms are found in the region. The rate of the market orientated enterprises is 20% and the 40% of farms sell their excess on the market. The technical equipment, mechanization and capacity measurements are show the best results in the country. The region play a key part in fruit cultivation as well. Although the Northern Great Plain has more fruit cultivation areas, the Southern region's production means a higher amount of quantity (Central Statistical Office, 2008).

Meanwhile the average rate of the employed in the agricultural sector is about 3-4% in the Southern Great Plain region this rate is 12%. In addition, the number of the employed women is the highest in the region. Compared to the national average it's a negative fact, that the rate of the population over 60 years is almost 10%. Another regrettable result is the slight number of high-educated employees, the most of the agricultural workers have at most primary education. After the Central-Hungarian region the Sothern Great Plain has the largest number of R+D places in relation with agriculture. Within the researches the most typical topics are the plant breeding, horticulture and biotechnology-aimed investigations (Gurzó et al, 1998).

2. Data and Methods

During my research I try collect and apply such datum and methods which will represent the aim of the examination. The first goal was getting to know if the Southern Great Plain managed to retain its key role in agriculture and if so, what segments are significant? In order to define them I elaborated 254 settlements datum from three counties (Bács-Kiskun County 119, Békés County 75 and Csongrád County 60). During the previous data collection I collected settlement-level datum about individual farms and agricultural enterprises as well, but I had to narrow the database. As I mentioned in the introduction, in the Southern Great Plain the presenceof individual farmers is more typical than the enterprises. Thus in order to see the other side of the coin I choose datum about enterprises to analyze. Focusing on the traditional land use was another standpoint, therefore I missed out the vegetable and fruit cultivation datum from this research. The short listed database contains the following indicators:

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- The number of enterprises engaged in agricultural activities (piece),
- Total area used by enterprises engaged in agricultural activities (m^2),
- Plow used by enterprises engaged in agricultural activities (m^2),
- Fruit cultivation used by enterprises engaged in agricultural activities (m^2),
- Vineyard used by enterprises engaged in agricultural activities (m^2),
- Lawn used by enterprises engaged in agricultural activities (m^2),
- Forest used by enterprises engaged in agricultural activities (m^2),
- Land out of cultivation used by enterprises engaged in agricultural activities (m^2),
- area of the settlements (ha).

The datum were available for all of the settlements in the years 2000 and 2010 so I could characterize the Southern Great Plain's agricultural changes. During the selection of the proper method it was important to choose complex methodology with new aspects. Conforming to the database I searched for a formula which could compare the settlements' datum with national datum. The transformation of an old method (Tivadar Bernát and György Enyedi, 1961) gives the bases of the analysis. They applied the following formula in the book called "*Production districts of the Hungarian Agriculture*" to define productivity. As a first step they compare the districts' crop yield to the districts' whole plow area.

$$\frac{m}{t} * \frac{t}{T} = \frac{m}{T}$$

In the formula: *m= the districts' crop yield, t=the examined plant's sown area, T= plow area of the district*. This rate means the average yield of the district. The next step was to calculate the national average yield (in country level).

$$\frac{t_0}{T_0} * \frac{m_0}{t_0} = \frac{m_0}{T_0}$$

Finally they compare this to rate to each other so they get the productivity coefficient.

$$\frac{m}{T} / \frac{m_0}{t_0} = \frac{m}{m_0} / \frac{T}{T_0}$$

This coefficient shows the district's share from the country's production based on the district's area. So, whether the yield is proportional with the sown area or is it bigger or smaller than it?

The last formula (after some transfomation and coordination of the units) is capable to show the national rate of almost any indicators. The transformed and simplified formula get the following notation:

$$\frac{q_{i-p}}{q_0} / \frac{t}{t_0} = r$$

In the formula q_{i-p} means the 8 examined indicators' values by settlements, the q_0 means the same indicators' values in country level. The t is the area of the settlement, t_0 is the area of the country. For example if we typing into the formula the number of enterprises engaged in agricultural activities in Kecskemét, we find out that Kecskemét share from agricultural enterprises compared to the country's average based on the settlement's area and the number of operating agricultural enterprises. The sign of the rate became *r* from the word *rate*.

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I got numbers between 0 and 1and above 1 as a result. Based on this I created three main categories in every case of indicators. The first is under the country's average ($0 \leq r < 1$), the second is nearby the national average ($r \sim 1$), the third is above the national average ($1 < r$). To illustrate the results I applied maps which were marked (1. table) in the same way in every case of indicators. In order to we could easily separate the levels, the under and nearby categories didn't have a special color.

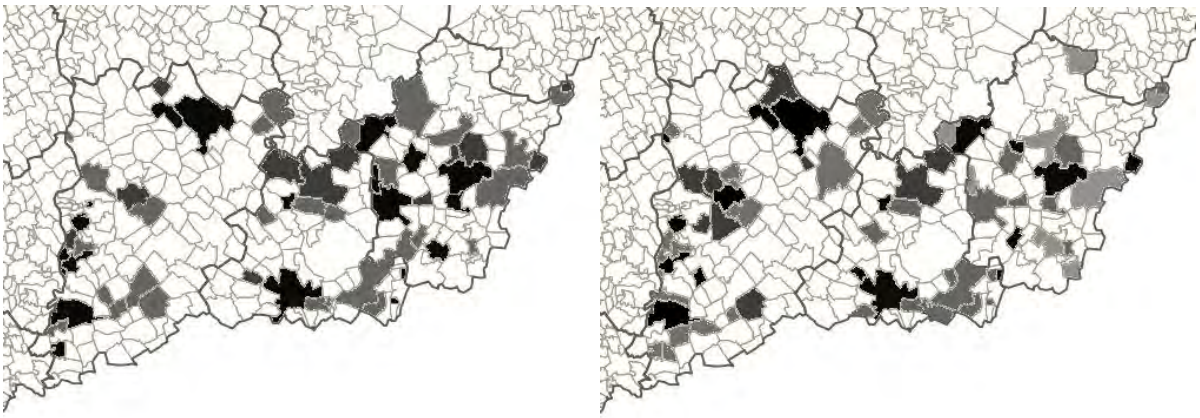
1. table: Color codes of the maps

Below the average	$0 \leq r < 1$	
Nearby the average	$r \sim 1$	
Above the average	$1 < r < 1,49$	
Above the average	$1,5 < r < 1,99$	
Above the average	$2 < r$	

Source: author's own edition, 2015

3. Results and Discussion

Fig. 1.: The number of enterprises engaged in agricultural activities 2000, 2010



Source: author's own edition, 2015

Figure 1. shows the Southern Great Plain's share form the enterprises engaged in agricultural activities in 2000 and 2010. In 2000 the 18,5% of settlements in Bács-Kiskun county, the 30% of settlements in Békés County and 24% of the settlements in Csongrád county are presenting outstanding values which are above the national average. In 2010 already the 26% of settlements in Bács-Kiskun County had an outstanding indicator meanwhile in Csongrád County this number is 28% and Békés County were stagnated in the past 10 years. The highlighted values in both years typically belonged to bigger cities and their agglomeration (for example Kecskemét, Baja, Szeged, Makó, Békéscsaba, Szentes).

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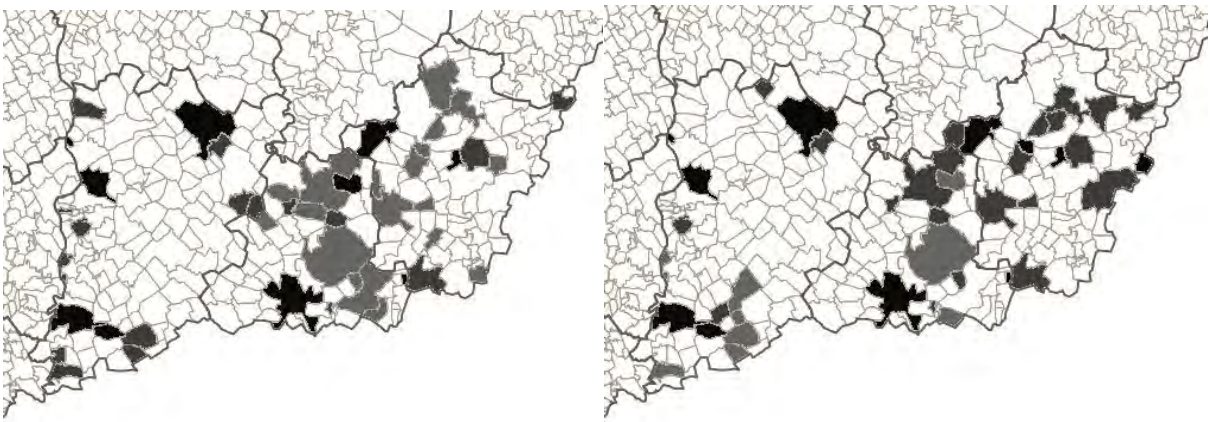
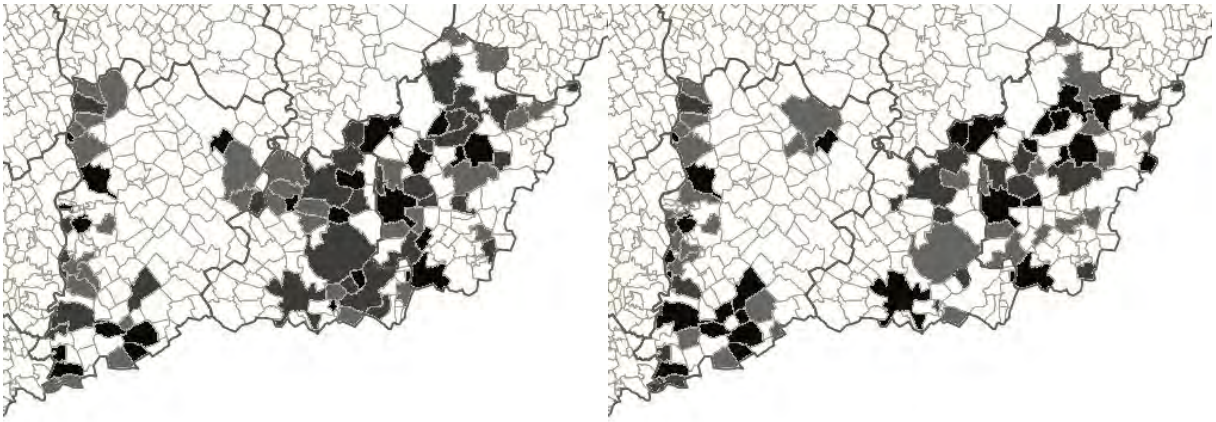
Fig. 2.: Total area used by enterprises engaged in agricultural activities 2000, 2010



Source: author's own edition, 2015

We can see the rate of the total area used by enterprises engaged in agricultural activities on Figure 2. It could be observed that the Southern Great Plain region is in a good situation. It means that in the region the number of the settlements above the average in 2000 reached the 20%. In county level Csongrád County had a 23,4%, Békés County had a 21,4% and Bács-Kiskun County had a 13,45% rate. Similarly to the number of the agricultural enterprises the key role is belongs to bigger cities such Kecskemét, Szeged, Baja and Hódmezővásárhely.The average region-rate was decreased until 17% in 2010 thanks to decadency of Bács-Kiskun and Csongrád counties' values.

Fig. 3.: Plow area used by enterprises engaged in agricultural activities 2000, 2010



Source: author's own edition, 2015

Figure 3. shows one segment of land use of the agricultural enterprises, the rate of used plow areas. Compared to the two previous figures in the year 2000 the most topping values could be observed in this case. It means almost 27% of the settlements in Bács-Kiskun County, 45% of settlements in Békés County and 35% of settlements in Csongrád County. In this way the regional average approaching 36%. By the year 2010 the regional rate decreased with 2% (34%) but it doesn't mean a radical recession. The increase in Bács-Kiskun County (2%) could not compensate the decrease of Békés (1%) and Csongrád (5%) counties. In the case of plow areas the cities' expansive agglomeration and the riverside of the Danube are also playing a role.

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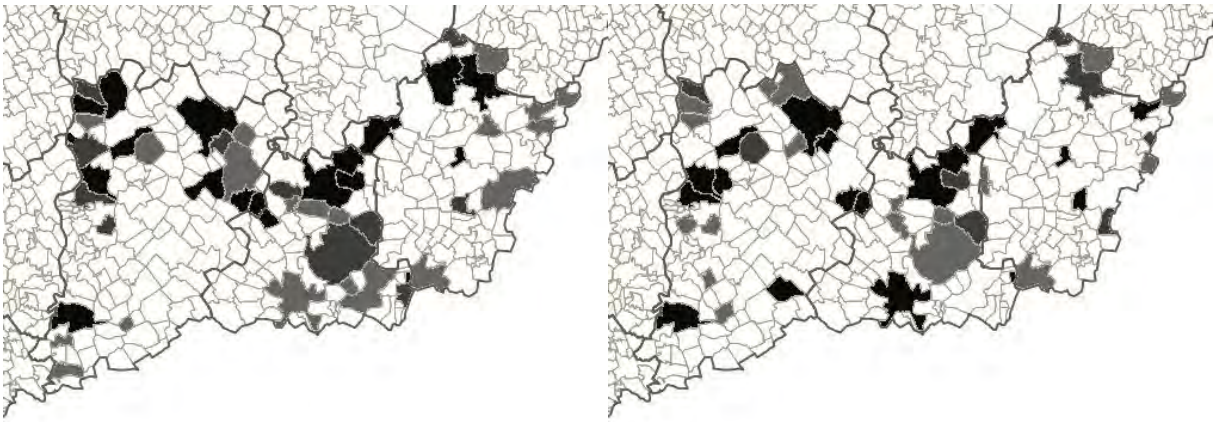
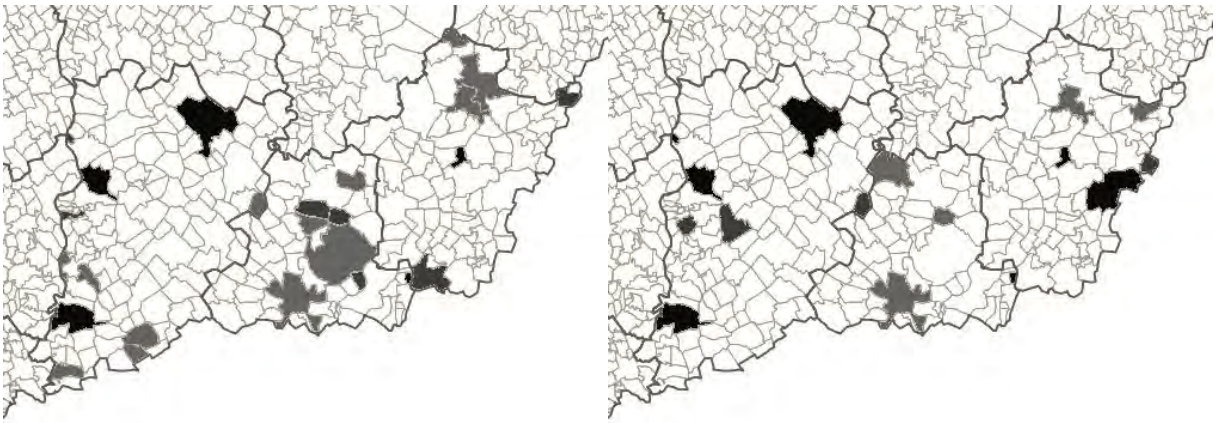
Fig. 4.: Lawn area used by enterprises engaged in agricultural activities 2000, 2010



Source: author's own edition, 2015

We could discover similarity in the rate of used lawn areas by agricultural enterprises and the communicated results so far which we could see on Figure 4. In the segment of lawn areas in 2000 the 20% of the settlements reached the above-average category. Bács-Kiskun County' settlements contributed with 19%, Békés County's settlements gave 17% and Csongrád County's settlements produced 25%. Ten years later the regional average dropped below 17%. Though the values of Bács-Kiskun and Békés counties were just slightly decreased, 10% of Csongrád County's settlements lost their position. The similarity is still stay in the illustration, the bigger cities get the dark color notations.

Fig. 5.: Land out of cultivation used by enterprises engaged in agricultural activities 2000, 2010



Source: author's own edition, 2015

The last map (Figure 5.) shows the rates of land out of cultivation used by enterprises engaged in agricultural activities. I think it was important to illustrate because I wanted to see "decline" of the agriculture of the Southern Great Plain from this point of view (this indicator could show telltale signs). We could see on the figure that the number of the settlements which are belonging to the above-average category is not significant. In 2000 10% of the settlements in the region belonged to the outstanding category and this rate were decreased until 6,4% by 2010. Bács-Kiskun's values decreased with 3,3%, Békés County's settlements contributed with 1,33% and Csongrád County's settlements gave a 6,67% decrease to reach the abovementioned rate.

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4. Conclusion

Based on my research results the Southern Great Plain is still a determinative agricultural region, area. It still able to accomplish the same amount of agricultural production described in the introduction. Furthermore it has several settlements which have values above the national average. Because these outstanding values could detected in sectors strongly related with plant breeding and livestock farming (number of enterprises engaged in agricultural activities, plow and lawn areas) it will be rewarding to put more emphasis on the agricultural activity in development documents.

Despite of leading the way in every sector of agriculture, the Southern Great Plain's competitiveness doesn't reach the required values. The previous studies and reports show that relying on the mechanization, the technical equipment, the value added and role of the agriculture in the GDP the sustainable competitiveness of the region could be available. To reach this purpose the experts should recognize the weak points.

The other positive side is that the amount of land out of cultivation is not significant and mostly concentrated nearby the densely populated areas. Probably the population growth, the spreading of the cities and the green field investments of the multinational corporations are the causes of process. In my opinion, the getting out of cultivation doesn't mean such a huge danger like in the other areas of the country, especially if we take into account the endowments of the region. The prices of the lands are the lowest in the Sothern Great Plain (maybe because of the distance from the capital and the infrastructural circulation) which could mean a potential hazard, as a result the lands could easily used for non-agricultural purposes.

The predominance of individual agricultural businesses could cause problems in the region. However, the most of the farmers produce for the market or sell their excess, moreover several individuals produce for export, the sales mostly proceed in the inside-region markets. Thereby the value added - which was produced here – couldn't get to further points of the country even if the facilities are available. The instance of the cooperation could be a solution, the question is: how/ what about the short food supply chain?

In the Southern Great Plain the amount of investments is not enough. There are two basic possible solutions to choose. One of these is the investment from abroad which means foreign enterprises in several cases. The other way is to emphasize of the EU supports which will be a complex solution for a while. By the help of EU subsidies the region could develop the technical and infrastructural conditions meanwhile the experts could handle the value added issues.

On the other hand between 2014 and 2020 a new programing period has been started in the EU, the Common Agricultural Policy- related subsidies has changed. For example the young farmers' program which will have a special attention in the next 7 years. In the Sothern Great Plain the rate of the population over 60 years is higher than the national average and the support could motivate the young farmers. The positive evaluation of the higher educated young farmers could mean the other side of the motivation. In the latter case it is a great benefit that in the region there are five cities which have university education in agricultural subjects: Szeged, Kecskemét, Szarvas, Gyula and Békéscsaba. If the graduated youngsters won't want to work directly in agriculture (on the fields) they could choose an indirect way, the R+D sector. By working for example in a biotechnological research center the entrants could increase the role of the region in the R+D sector.

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Interrelations of the space usage in the regional development

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Abstract
Land management and space use are the most comprehensive land-use categories. The concept of land use includes not only the renewable and non-renewable system of natural resources of defined areas on, below or above the surface, but also infrastructural, economic and social interrelations as well. Overall, we can say that the regional competitiveness is formed by the combined effect of these factors, which requires a more complex analysis of spatial competitive advantages instead of comparative advantages. The legitimacy of this approach is proven by the fact that even the seemingly independently used natural resources have a significant impact on the economic and social relations, and on the utilization efficiency. In our study we deal with the analysis of these spatial system relations.

Keywords: *spatial use, regional development, space use, rural development*

JEL Classification: *R58*

1. Introduction

There are significant regional differences in Hungary regarding to the economy and social factors, the settlement network and the welfare of the population. The inequalities in incomes, infrastructure, the efficiency of production can be measured in the economic space, and can be significant even between two neighbouring settlements. Space management, spaces use is the largest general category of land use. In space management the horizontal principles established in the National Development and Regional Development Concept must be observed and followed. Some examples to these principles: sustainable space use; high quality space use planning in order to ensure the protection of important values and accessibility; efficient and sustainable regional systems; ensuring the flow of people, products and energy. The concept of land use includes the management of every geographical aspect (renewable and non-renewable energy resources, water surfaces, natural areas being potential tourist attractions, etc.) beside the infrastructural, economic and social factors in a certain region.

The abovementioned factors have a huge impact on regional competitiveness, which requires nowadays the analysis of not only the comparative, but the competitive advantages as well. This approach is very well proved by the fact that natural resources which can be utilised seemingly only independently affect socio-economic processes and the efficiency of the utilisation a great deal. (Kollár K., 2012)

2. Data and Methods

The paper uses national literature (books and journals) to investigate the changes in space use in Hungary from the beginning of the 1990s to the middle of the 2010s with special attention to the sectors of industry and agriculture. To demonstrate the land uses changes, certain diagrams are used (regarding to forests and arable land), also from the 1990s to nowadays. Besides literature review the study uses secondary data from Hungarial databases (Területi

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Statisztika Publications, Hungarian Central Statistical Office and Hungarian National Spatial development and Settlement planning Information System).

3. Results and Discussion

The first part of the study deals with the concepts of land use and space use. Space use is the complex system of utilising renewable and non-renewable resources found in an area (on, below and above the surface) in such manner that it supports the welfare of people.

Land use is a part of space use, because it includes only some certain parts of space use. It is, in the same time, a wider concept, since it also includes the processing and services. Land use is a way of utilising land for production in different types of lands (arable land, orchards, forests, etc.). Land use consists of the systems below:

- Primary production,
- Secondary production (Processing),
- The tertiary sector (Services),
- The quaternary sector (land types important for the regeneration of human capital),
- Forestry and game management,
- Mining,
- Water management,
- The utilisation of lands used for processing,
- The utilisation of lands used for the services sector,
- Recreational land use,

  *(*www.agr.unideb.hu/~megyesat/Hulladek/Mgfoldhaszn.ppt*)*

The changes in the land use of Hungary (arable lands, forests, pastures, etc.)

The current structure of land use types is the result of a long-term process, which was affected by land management, social and economic development, land policies, agricultural policy aims, and legislative processes related to the factors mentioned above

Due to a very advantageous soil endowment the largest areas in Hungry are arable lands since 1945. Even after the Transition in 1990, more than 50% of the total area of Hungary consists of arable land. By the end of the 1990s in the case of weaker land the supply, in the case of more advantageous lands the demand was more dominant. It is more than 4/5 of the total area of the country is arable land or forests, the rest is land non-usable/not used for agricultural production. At the beginning of the third millennium it is predicted that land use will be more diverse than in the 1980s, which means that arable lands will decrease. On the most environmentally sensitive areas 788,000 hectares are planned to be used as pasture. From the Natura 2000 areas 20% is arable land and 20% is forests. (www.ksh.hu)

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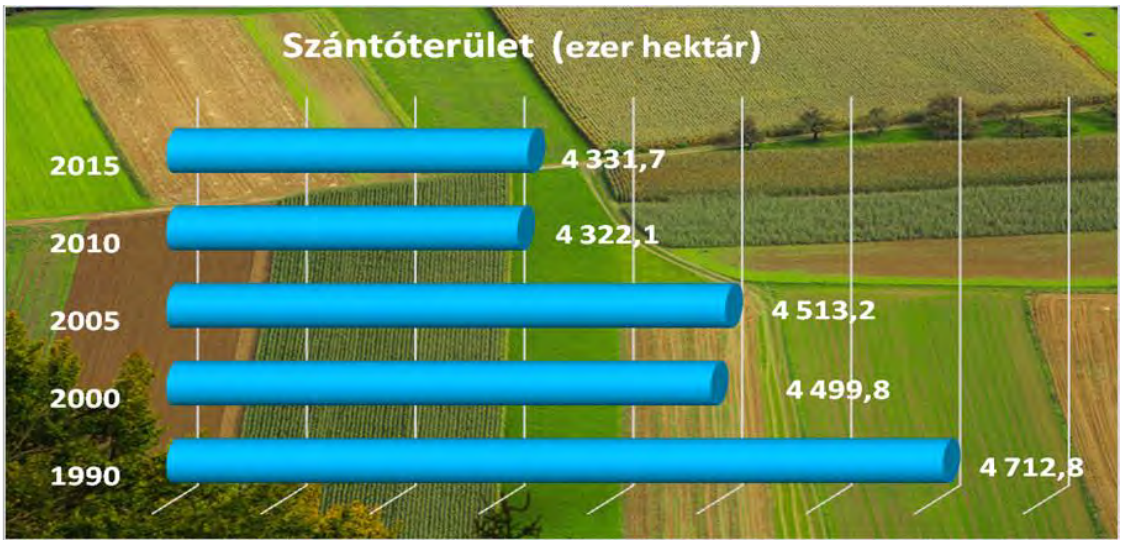
Figure 1 The changes in arable land in Hungary



Source: Own edition based on www.ksh.hu

Hungary is in the top countries in the European Union based on the amount of its agricultural lands. Approximately half of the arable lands have very high agricultural potential. On the other hand, 10% of them are situated in environmentally hazardous areas. This means that arable lands and pastures will probably decrease in the future; in the same time forests and water surfaces are expected increase.

Northern-Hungary and Southern-Transdanubia are the most typically forest-covered areas. Between 2000 and 2010, along with the decrease of agricultural land, the lands in all the other utilisation types decreased, except for the pastures. Based on data from 2010 the most significant segments of agricultural land are arable land (82%) and pasture (14%). The distribution of forests, as one of the most significant land use types, is not equal in the country: it takes 11-12% in the Great Plain region, but the rate of forests is much higher in the Northern-Hungarian regions, where it can be 29%. In the agricultural lands of companies the percentage of arable land is higher; the rate of orchards, vineyards and pastures is lower than in the case of individual farmers. (www.ksh.hu)

The land use types differ among different counties. Arable land is more than 90% of the total area of six counties (Baranya, Békés, Fejér, Komárom-Esztergom, Tolna és Vas megyében). Companies use 49%, private farmers use 51% of the arable land. *(*https://www.ksh.hu/docs/hun/xftp/idoszaki/regiok/mezoter10.pdf*)*

More than one-fifth of the total area of the country is covered by forests. There area has been growing since the middle of the last century; by 2008 it reached 1.9 million hectares. Forests situated in a very concentrated manner in Hungary. As it was mentioned before, mostly the Northern areas and the South-Transdanubian areas are covered with high amounts of forests, while the Great Plain and Central-Hungary does not have much of these areas.

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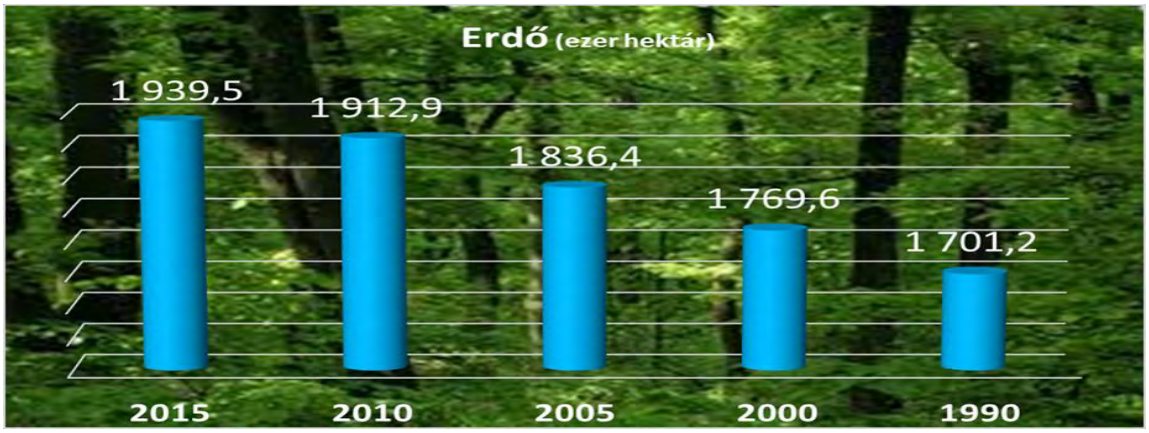
Figure 2 The changes in the total area of forests in Hungary

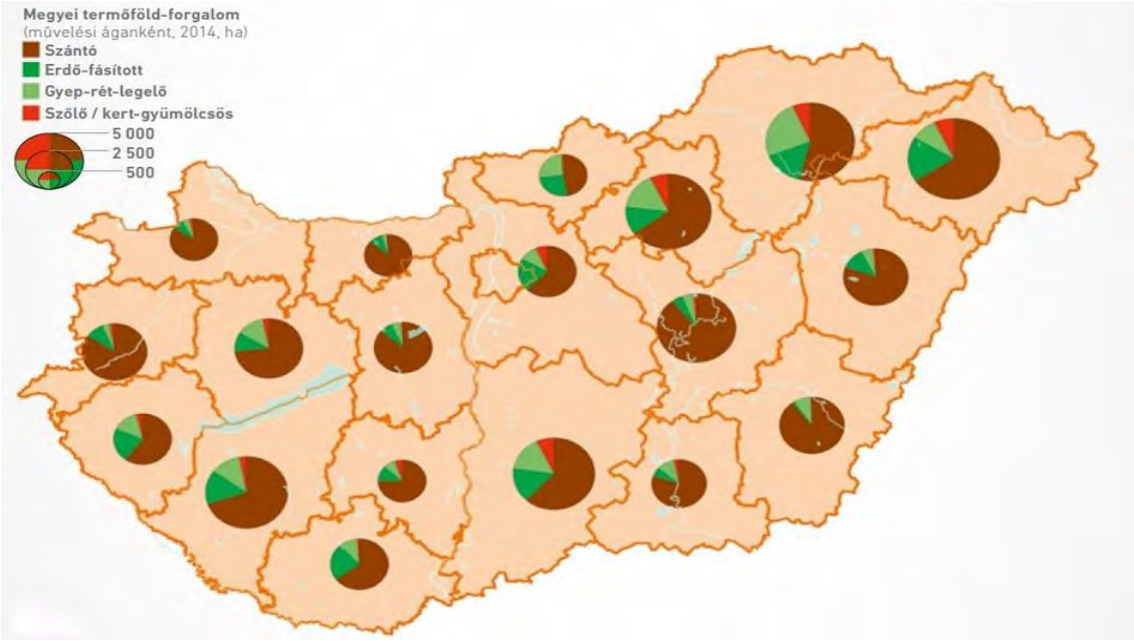


Source: Own edition based on www.ksh.hu

Areas primary for forest management – which include not only areas covered by trees, but also roads used by forestry authorities, forest-railways, etc. – cover approximately 2 million hectares. More than half of this area (56%) is in the property of the state, but the privately owned areas are significant too (43%). The rate of private forests has gradually increased since the beginning of the 1990s. The percentages of privately owned forests are similar to the general percentages mentioned above. The percentage of private ownership is the highest in the Northern-Great Plain region (62%), while in Central-Transdanubia approximately 70% is till state-owned. (Mezőgazdaság fejlettségének regionális különbségei, 2008)

Observing the country as a whole we can establish that the majority (63%) of the forests has economic purposes (managing production, lumber production, game management etc.). Since 2005 the rate of economic purpose forests is the highest in the Northern- and Southern Great Plain regions (which are also the least covered regions). The majority of the forests (63%) serve as 'lumber production areas', their rate is higher in every regions (with two exception) than 50%. (www.ksh.hu)

Figure 3 County level arable land circulation (by land use categories, 2014, ha)



Source: OTP Termőföld Értéktérkép, 2015

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In 2014 78.3% (7.28 million hectares) of the total area of the country is cultivated area. From this amount it is more than 59% is arable land, approximately 27% forests, more than 10% is pasture and the percentage of vineyards, orchards and other categories together are lower than 4%. Based on the circulation of land (observing the total land area in acquisition contracts) we can establish that there was a 20% decrease in 2014. On the other hand, on average, the lands sold were larger than in 2013. The amount of lands sold grew in five counties. In 2014 71% of the lands sold were arable land, 13% was forests, 12% was pasture and 2% were orchards-vineyards. The total area of lands sold increased in five counties (Heves, Komárom-Esztergom, Veszprém, Vas és Borsod-Abaúj-Zemplén), and it decreased significantly (with 40%) in three counties: Győr-Moson-Sopron, Baranya and Csongrád. (OTP Termőföld Értéktérkép, 2015)

Regional differences in Hungary

As it was mentioned above, there are significant regional differences in Hungary regarding to the economy and social factors, the settlement network and the welfare of the population. The spatial structure of society and economy – no matter how important the counties' role is – is not influenced significantly by the county system. Regional flows cross county borders. There are many social spheres for which regions (which are higher levels than counties) must provide management systems (Palkovics, 2000). Differences in development levels and economic structures are strongly related to the differences between settlements, settlement types.

There have been two important trends affecting the Hungarian settlement network in the past three decades. One is a pairing process, in which firstly the larger, regional centres, than the smaller, local centres become stronger, and which brought about agglomeration processes around the centres. On the other hand, the village network has differentiated, which manifested in the renewal of settlements in the proximity of cities or with relatively large population number. The changes also brought about a certain process in which the development levels small settlements on the peripheries decreased. (http://www.mtafki.hu/konyvtar/kiadv/FE1990/FE19901-4_133-149.pdf)

There are large inequalities between different parts of the country in many ways. Based on regional GDP data, the economic backdrop in 2009 further amplified regional differences, especially when comparing the central region to all the others. In the same time, the economies of regions which used to perform well decreased, while lagging behind regions did not fall back as much. The relative prosperity after the recession in 2010 brought back basically the same situation which could be observed before the crisis, primarily by improving the position of more developed Transdanubian regions. Judging by the indicator most commonly used for measuring regional differences in economic development, the GPD per capita, the order of regions did not change much compared to the previous year; although, there were some changes. The difference between the most developed region (Central-Hungary) and the, more developed regions (in Transdanubia) decreased to some extent. However, compared to the less developed regions the advantage of the central region has remained the same in 2013. Compared to the Northern-Hungary region (the least developed region in Hungary) the most developed Central-Hungary region I was 2.7 times more developed, considering its GDP per capita. (KSH, 2014). Based on differences in GDP, regional disparities have increased between 1990 and 2006, mainly because of the high growth rate of Central-Hungary. Then, until 2008 the differences stagnated generally, which meant that with the slowing growth rate the development gaps did not become grow either. The economic backdrop in 2009 contributed again to the higher growth rate of the Central-Hungary region; in the same time, it resulted that rural regions became closer in development levels due to the decreasing growth rates of developed regions. The relative growth in 2010

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resulted that the situation was the same as before the crisis, which means that the advantage of Central-Hungary decreased, judging by its GDP per capita. (KSH, 2012)

Figure 4 GDP per capita on regional level as a percentage of the country-level average

Source: The authors' own editing based on the Területi Statisztikai Évkönyv, 2014

The performance of Central-Hungary was 1.6 times higher than the average in 2010. After the recession the development level of Western-Transdanubia has reached the national average, while the development level of Central-Transdanubia was at 87% at that time. None of the less developed regions could get closer to the national average. The GDP level of South-Transdanubia decreased by 1.1 percent compared to the national average, while in the case of Northern Great Plane this percentage was 1.6%, with 63.5% of the average. Northern-Hungary had been at the end of the order of development level, but its position decreased the least among the regions.

The economic structure of Hungarian regions was not affected significantly by the recession and the subsequent recovery. Judging by the national regional structure we can establish that areas without cities or larger town predominantly stagnated at best, or their economic growth decreased at words. The reason behind this is that the attraction power of economically and socially weak regions with well-defined and strong centres is very low, which are limits the amount of capital flowing to the area; therefore, services contributing to the welfare of the population will not be encouraged to settle down in the region (KÁPOSZTA, NAGY, KOLLÁR, 2010). In 2010, after the recession, the export-oriented economic branches grew; the ones based on internal trade shrank or stagnated. Two-third of the GDO was produced by services and one-third was produced by production (agriculture, industry, construction) on national level. The high development level of the central region was resulted mostly by the services sector. Besides, in the Central-Hungary region the percentage of services is very high (77%). Industry became strong again within the economic structure of the two relatively developed Transdanubian regions to the same levels as before the crisis, which is more than one and a half times higher than the average; they also contributed much to the significant increase in automobile production in 2010. That is the reason why more than half of the gross value added produced by the industry sector in Komárom-Esztergom and Győr-Moson-Sopron counties (KSH 2012). Industry accounts for a higher-than-average rate in the economic structure of Northern-Hungary (especially in Heves and Borsod-Abaúj-Zemplén counties), where it was 34% in 2010.

To sum it up, we can establish that between 2005 and 2013 the gross value added was produced predominantly by services and industry, followed by construction and agriculture.

4. Conclusion

Regional disparities are typically high in Hungary, which indicates the lagging-behind status of rural regions. The most usual economic activities, opportunities in these regions are agricultural production, forestry and recreational services, as it was shown by data above. Compared to more urbanised areas, there is a significant lack of jobs and services. Based on the GDP and land use analyses we can establish that the indicators of rural areas generally show lower results than the urban areas. Furthermore, there is pattern judging by the income produced in a certain area and the land/space use characteristics. GDP per capita is lower in areas with more workforce working in agriculture and with higher GDP produced by agriculture and forestry. Based on the data analysed, in the economically relatively developed Central-Hungary, Western-Transdanubia and Central-Transdanubia regions gross value added produced in industry and services is more than in less developed regions, in which the gross value added produced in forestry and agriculture is higher. The gross value added produced in agriculture and forestry by the Central-Transdanubian region was HUF 128 874 million (EUR 416 million) volt, which is much lower than in the Northern- and Southern Great Plain regions, where it was approximately HUF 248 606 million (EUR 801 million) in 2014. In the case of more developed regions the flow of qualified workforce to cities was a very significant factors, similarly to the dense road network, the development level of motorways and railways, the presence of industrial parks, which resulted the decrease of cultivated areas. Economic growth and competitiveness depend a great deal on the competitiveness of the economic sectors and capacities of those areas.

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The new trends of management in the agricultural enterprises

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Abstract
In the course of the last two decades the agricultural enterprises underwent the reasonable organizational changes, restructuralization of their managerial structures, in radical way have been changed the ownership's relationships, even more, in significant way had been transformed the requirements on the manager's competencies. Modern organisational and managerial structures were introduced, and moreover, new progressive technologies have been developed. The last mentioned factor and the others, significantly supported the increase of labour productivity both managers and other employees, as well. The objective of submitted paper is to perform the analysis of the development's trends in relation to the managers'competencies, to identify those factors which according of the farm managers represent the key conditions for business success. The results are stemming up from the research carried out in 18 agricultural enterprises having the middle size. The EU accession meant for many agricultural enterprises the need to undergo number of rationalization's measures. From the achieved responses is clear that majority of the enterprises implemented various measures in the field of human resources, in delayering their managerial levels, slimming the organizational structures, new investments and technologies have been introduced, or new diversification programs have been set up. The results confirm that there are meaningful changes in the competency requirements linked to agromanagers's preparedness for their effective performances. Furthermore, significant changes have been noted in relation to the social responsibility. In the surveyed agricultural farms is dominating their concern for environment protection.

Keywords: *enterprise, factor, change, management, new trends, social responsibility success, trend*

JEL Classification: *E240, O180*

1. Introduction

For the business company success and competitiveness is immensely important implementation of professional management. With limited knowledge about internal conditions and impacts of external factors, the managers have only limited capacity for qualified managerial decision-making processes, or to use effectively the adequate managerial techniques and tools having in mind the aim to achieve sustainable development of the agricultural enterprises. Transition from centrally planned economy on the market economy, as well as the accession of Slovak Republic to the European Union (EU|), this all together represent the changes which in significant way determined the next entrepreneurial development in this sector. In the course of almost three decades the agricultural enterprises underwent through meaningful organisational changes, restructuralisation of their production structures. Furthermore, ownership changes have been radical; the requirements on the managerial competencies and even the ordinary staff have been continuously adjusted to the new environment. Moreover, the priorities of agricultural enterprises had been re-evaluated, there have been noted changes in organisational and managerial structures, in addition to this, and new techniques, equipment's and technologies have been implemented. This everything,

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in significant way from technical and information point of view facilitated the working activities of managerial and other staff. The most important role from this point of view play information technologies.

The objective of submitted paper is in line with above expressed starting points following the intension to evaluate the current status of management in the agricultural enterprises of the Slovak Republic and to carry out the analysis of development trends in the managerial competencies.

2. Literature Review

Current market conditions are highly competitive and they are facing frequent changes. In fact, these challenges are evoking pressures on management, decision-making methods and on the introduction of changes, in order to ensure the successful business strategies. Kreitner (2008) states that: „ Management represents work with people and with them, in order to achieve the set of objectives in changing business environment. " One of the most recognised authors dealing with organisational changes Kotter (2010) wrote that we live in the era of more frequent changes. In the coming years the space of the changes will speed-up due to the introduction of new technologies, which will influence the all companies. In this respect, the author states that: „ Far better results we can achieve if we will lead the changes, instead of manage them. " According of Welch (2005), it is important to follow the direction of the changes in the external environment. This is important owing to, that if the change inside of the organisation is smaller as the change in the external environment, then the result is that company falls into the economic depression. Řezáč (2009) is dividing organisational changes' methods on internal, continuous and critical.

New approaches to the management utilisation are connected to the introduction of knowledge management. OECD (2003) defines the knowledge management as purposeful and systematic process at the acquiring, registering, sharing and utilisation of productive knowledge with objective to facilitate education and through it the enhancement of the organisation's productivity. Russell-Wailling (2012) state, that knowledge can lead to the better decision-making results, it supports innovations, increases productivity and creates competitive advantages.

According of Kislingerova (2007), Rydvalová & Rydval (2007) and Kachaňákova (2007), into the forefront of the management are infiltrating new trends, among which are dominating such as project management, new concepts of strategic management, re-engineering, quality management, management of information, flat organisational and managerial structures, outsourcing, insourcing, offshoring, outplacement and new trends in the development and leadership of human resources.

3. Methodology

In the 18 agricultural enterprises had been carried-out the questionnaire survey with intention to explore the current status in the implementation of methods, techniques and managerial tools, in the utilisation of project management, production diversification, the use of the knowledge management and innovation approaches introduced by top managers of the agricultural enterprises. The aim of research is to identify those managerial competencies which according of agro-managers are represent key assumptions for business success and

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through their active use the companies could be more competitive. The research was undertaken from April till November 2015.

In to the research, have been included agricultural enterprises with average size 1450 hectares of arable land. 35, 3 percent of them were established more than 30 years ago, 38, 9 percent are the companies which had been originated more than 10 years ago and 14, 7 percent of enterprises are acting in the sector less than 10 years. The number of newly created companies is low with 11, 1 percent.

In the case of questions related to the leadership styles and managerial competencies was utilised statistic Friedman test. The testing result is p-value (Asymp. Sig), which is equal to certain value, if this value is < 0, 05 (significance level value), the null hypotheses on equality are rejected. In order to achieve the objectives which have been set up, two hypotheses had been defined, both of them are introduced in the results of this paper.

4. The New Trends in the Management of the Agricultural Enterprises

The requirements on the managers of the agricultural companies by the multiplied socio-economic transitions from 1990 are gradually changing. Into the forefront are infiltrated new competencies and in contrary others are withdrawing to backward. Alongside of the transition process from centrally planned to market economy, the great challenge for agricultural sector was its preparation on the EU accession, as well as the impacts of this accession on the overall processes in the agricultural enterprises. The dynamic of these changes was influenced by the global economic development, furthermore, by the volatile prices development of food commodities, financial and global economic crisis, as well as by the economic sanctions against of Russian Federation and visa – versa. As it is above stated, the main objective of this paper is evaluation of the recent state of management and its development trends in the agricultural enterprises of the Slovak Republic.

Stemming from the processed responses of the undertaken survey, in the group of agricultural companies, the largest share is represented by small companies (55, 6 percent) and 11, 1 percent is represented by micro-companies. There is no one large company.

Table 1: The structure of enterprises according of their size

	Frequency	Percent	Valid Percent	Cumulative Percent
Microcompanies	2	11,1	11,1	11,1
Small companies	10	55,6	55,6	66,7
Medium companies	6	33,3	33,3	100
Total	18	100	100	

Source: own results

With regard of the top managers' achieved highest education level, more than 88 percent have university master education, and even more than 11 percent achieved higher level with PhD or MBA degree. These data are documenting good preparation of managers for successful fulfilment of their managerial functions. The very critical is age structure of managers; just five percent of them have age below 50.

In the case of questions focused on the leadership style and requirements on managerial competencies was utilised statistical Friedman test.

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The question was as follows: The management is using given leadership style in equal frequency? (autocratic, participative, democratic, liberal). In this question are incorporated four interdependent values. For Friedman test have been selected following hypothesis:

H_0**:** Management is in equal frequency using given leadership styles.
H_1: Management is not using in equal frequency given leadership styles.

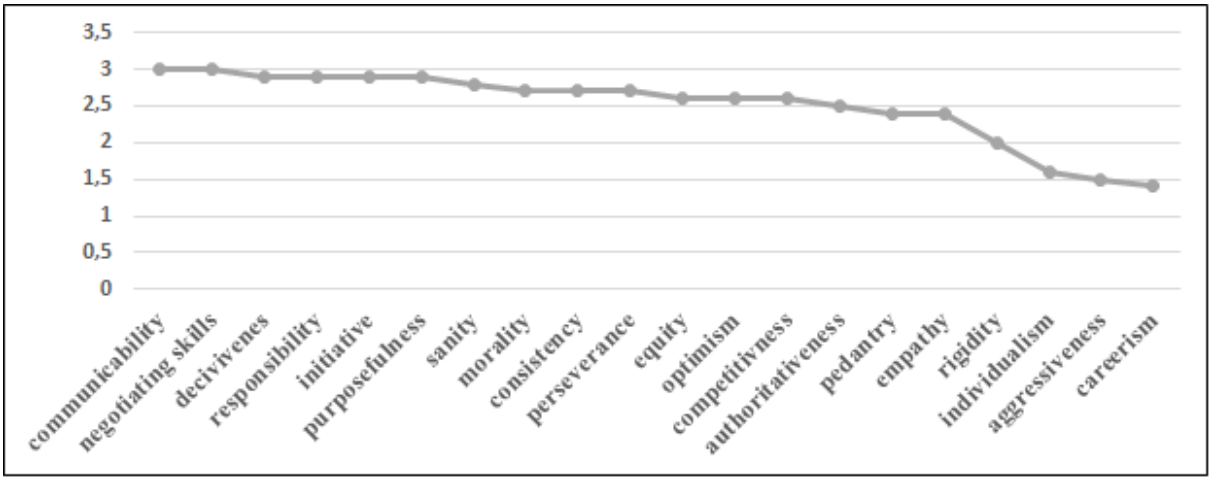
The result of this test is p-value (Asymp. Sig), which is equal to 0,008. Since it is valid that 0,008 < 0, 05, the null hypothesis is rejected. From test is clear that autocratic, participative and democratic leadership styles are used in equal frequency; however, the liberal leadership style is in the practice of surveyed enterprises less frequently applied.

The next analysis was carried-out in the following question: The respondent understands the given managerial competencies as equally important? For Friedman test have been selected following hypotheses:

H_0: The given managerial competencies are equally important.
H_1: Management competencies are not equally important.

The result of the Friedman test is p-value (Asymp. Sig), which is equal to 0,008. Since it is valid that 0,000 < 0, 05, the null hypothesis of equality is rejected.

Figure 1: **The importance of the managerial competencies as they are perceived by the managers involved into the survey**



Source: own results

From Figure 1 is resulting that the most important managerial competencies according to the managers involved into the research are: purposefulness, communication, negotiating capabilities, decisiveness, responsibility, initiative, prudence, moral, principles, diligence, fairness and optimism.

The surveyed enterprises are implementing simple organisational and managerial structures. This is obviously caused with the smaller size of the surveyed group of enterprises. Dominating is functional organisational structure in the case of 55, 56 percent of enterprises, then follows combined branch/sectorial and functional organisational structure which is benefiting from the strong features of the branch/sectorial and functional organisational structures with share of 27, 78 percent. So far, in the larger agricultural enterprises are maintained some features of the branch/sectorial organisational structures (5, 56 percent) and last but not least is represented product structure, which appeared only in the one case. No one from the complicated matrix structure or projects structures was noted, despite of the fact that

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after the EU accession the larger agricultural enterprises are actively involved into the management of the projects.

Strong driving force in the Slovak agriculture is diversification. Even in 94, 44 percent of surveyed enterprises consider diversification as important for maintaining the viability of the production, economic, social and ecological enterprise's functions.

The most frequently discussed question is, whether the membership in the effectively functioning supply and sale cooperatives/associations, would lead to the more effective sales of agricultural products on the commodity markets? With regard of this question, are appearing more opinions. Some of the agro-managers, this kind of solution consider as immensely important due to the opportunity to achieve more balanced price policies, as well as due to better positioning of their products at the markets. Others, especially smaller farmers argue against of it. The enterprises involved into our survey are open to the cooperatives/associations, 66, 67 percent of them take benefits from such a memberships. Two companies are even associated in the multinational alliances focused on the supply and sale activities. Only 33, 33 percent of involved companies are not participating in any cooperatives/association.

The one of the modern trends of contemporary management in industrial companies and in the service sector is the outsourcing. Recent management tendencies are focused more on slim organizational and managerial structures. This is considered as one from the more resolutions that how to safe costs in the company and to adjust it to the recent conditions in such a way that it will be more successful at the market. In simplified form under the outsourcing we understand the renting of the activities and services from external firms, instead to produce this kind of activities in the own company. Outsourcing, as such has already penetrated into the agricultural enterprises. From 18 companies, half of them are utilizing this kind of activity.

In Slovak Republic, after the EU accession were introduced by agricultural farms wide range of rationalisation measures. The above mentioned is valid also for the half of the surveyed group. The above measures are as follows:

1. In the more as 50 percent of agricultural enterprises the top managers are realizing different rationalisation measures in the field of human resource management (downsizing the staff number, introduction of new motivation measures etc.), the organisational structures had been adjusted with delayering, simplification of managerial relations, establishment of new managerial or other staff's functions;
2. The new investments have been carried out into the progressive technologies and equipments with intention to decrease the costs and increase the agricultural commodities' prices, the cultivation procedures have been also adjusted (e.g. crop rotation, utilisation of minimization soil processing technologies, environment friendly technologies, animal welfare), new diversification programs had been introduced;
3. The agricultural enterprises became members of the supply/sale associations, in order to increase individual actors' negotiating power at achieving lower input prices and higher output prices (e.g. procurement of feeding components for animal production, for sale of milk, life animal and other products);
4. The significant measures had been applied in the field of energy savings.

The positive development was also noted in the agricultural enterprise 'social responsibility. In their responses managers underlined first of all, their relations to the environment protection. This is about bio-farming, furthermore about crop rotation, implementation of anti-erosion cultivating systems and introduction of good farming practices.

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The top managers on the question that where they see the changes and the most significant impacts on their professional competencies after the EU accession, expressed following opinions:

1. Higher level of life long education and more dynamic activities in the agriculture, upgraded professionalism as the consequence of better information flow;
2. Uncertainty in the employment, large competitiveness, daily strives with intention to prevent enterprise in front of recession or bankruptcy, bigger stress and pressure in the job;
3. The requirements to immediately react on the changes in business environment (especially on the frequent changes in legislation) and adaptation on a new external entrepreneurial conditions;
4. Increased demand to accurately perform strategic decision-making processes with regard of financial management and land procurement; furthermore, there is the necessity to pay due attention to the short-term objectives;
5. The permanent pressure on the cost decreasing in order to increase the enterprise competitiveness;
6. The top managers from the surveyed group of enterprises, in positive way perceive after the EU accession bigger stability in the financial flows, owing to the direct payments and in other supporting programs, wider opportunities for benefiting from supporting programs and the free trade area as well as from the free movement of persons.

In relation to the external environment the agricultural enterprises are faced with following challenges:

- Pressure on the higher productivity and upgraded quality of their commodities.
- The imperative is to be flexible with immediate reactions on the quick changes in the business environment.
- Unavoidable, is continuous introduction of new managerial methods, tools and technologies.
- To take active part on the life-long education activities.
- To introduce new managerial and operational methods in order to be well prepared on the changes at the market and its organisation, what is stemming from new specific forms of the supply/sale relationships.

4. Discussion and Conclusions

Slovakia's EU accession meant for many agricultural enterprises necessity to implement various rationalization measures. From the research is stemming out the conclusion, that at least half of the enterprises are realizing different measures, especially in the field of human resource management, organizational structure, new diversification programs, enterprises entered into the various associations/cooperatives. Numerous measures had been undertaken in the field of energy savings.

The most important conclusion of the above survey is the fact that age structure of recent top managers acting at the farms, is too high; there is the urgent need for change. The older managerial staff deserves the full recognition and respect, due to its active involvement into the transition process as well as due to preparation the sector on the EU accession. However, there is the ultimate time, to leave their recent top managerial positions, in order to free them to younger more dynamic generation which will take up the full responsibility for the future development of this sector. However, it is important to highlight, that this new generation will

be also at least so much enthusiastic for its profession as it is in the case of outgoing generation.

In line with authors Kotter (2010) and Kreitner (2008) the results of undertaken survey confirm that also surveyed group of agricultural enterprises is faced with permanent organizational changes. In this respect, the knowledge management is more utilized by the agro-managers; this is in line with claims of Russel-Wailling (2012), OECD (2003). Managers are actively involved into the various education activities, respectively they require from their subordinates to take intensive part on different internal or external educational programs. This refers mainly to the project management, agricultural extension and environment protection. For agricultural enterprises is characteristic delayering and more flat organizational structures, decreased number of employees, they do prefer employees working on temporary contracts during the harvesting periods or during the pick seasons. The enterprises are using outsourcing, also they do implement some of the management quality 'systems. The last is in line with results of authors Kislingerová (2007) and Rydval & Rydvalová (2007).

The agricultural enterprises have to deal with pressures on the cost decrease, they have to upgrade the outputs and their quality, they are obliged to adjust the human, technical and financial resources to the changing legislation and overall external environment, to adapt on the changes at the market organization and to introduce specific forms of supply/sale relationships, to introduce strategic alliances among the partner organizations and to in continuous way to develop new management methods and take part on education programs.

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School closures in rural Hungary

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Abstract
Schools play important role in the sustainability of rural communities, since they provide basic education and economic opportunities in rural areas. Moreover, schools are often the social hubs of the villages and serve as cultural centres, too. Therefore, this study is going to show the benefits and the negative effects of school closures in rural Hungary. The main goal of this paper is to identify the community-level characteristics associated with the presence or absence of a school.
In the summer of 2015 territorial databases of the Hungarian Central Statistical Office were studied. Village-level demographic, social and economic indicators were analysed and it was found that the better socio-economic situation of villages with school was not clear. The authors established that the villages with schools had better demographic performance, partly better living and infrastructural conditions, but the employment and the welfare characteristics were worse, compared to those without schools.

Keywords: *consolidation, education, Hungary, rural community, school closure*

JEL Classification: *I25, O1, Q01, Y90*

1. Introduction

Schools are vital to rural communities, since they can provide many social, economic and other functions. First of all, school is an educational institute. Secondly, it can provide economic and social opportunities. Thirdly, it can be an arena for local politics. Moreover, it can become a delivery point for services and a resource for community development. Lyson (2002) agrees with the above-mentioned functions of schools in rural communities, and he draws our attention to their social and cultural roles. Since the school can be not only the social hub of the village, but also contributes to the cultural development of the community. So the schools serve as social and cultural centres, too (Lyson, 2002). According to Witten et al. (2001) schools can serve as catalysts for community participation, social cohesion and the vitality of neighbourhoods.

The next figure and tables show the proportion of Hungarian settlements which don't have primary schools or upper (5-8) classes. In 2012, 42 % of the settlements didn't have primary schools, and in every second settlement missed the upper classes. As it is demonstrated, there was a decreasing tendency in terms of settlements having primary school. In years 2006-2007 significant number of settlements lost primary education facilities. It happened basically due to the minimum headcount requirements for schools as it was regulated by the new Public Education Act. In that villages lived 5 % of 6-13 year old pupils in 2012. Further 2,5 % of pupils lived in villages, where only 1-4 classes existed (Varga, 2015).

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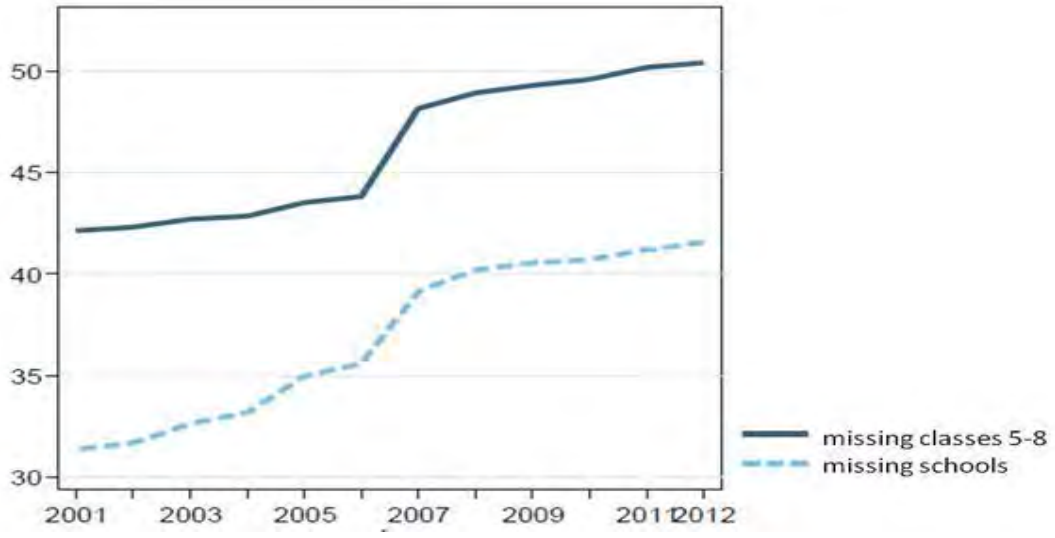
Figure 1: Proportion of settlements without primary school in Hungary (%)



Source: Varga, 2015

Table 1: Proportion of villages without schools in 2013 (%)

	population 500 or under (%)	population between 501-1,000 (%)	Total population (%)
Hungary	92,7	40,2	46,1

Source: own edition based on the data of Hungarian Central Statistical Office, 2013

Balázsi and Bódi (2011) illustrate the situation on a similar way. Between May 2006 and 2009, 141 schools were closed in Hungary. 70% of these schools were in small and medium sized villages (Balázsi & Bódi, 2011).

School closure in rural communities is not only a Hungarian, but a worldwide known problem. According to MacDonald (2003) each community feels the loss of its local school. Negative effect of the school consolidation is that it can cause divisions within and between rural communities, especially when there is competition between schools for pupils. Disadvantageous economic impacts are also important. On the one hand, parents may be more likely to spend money locally if their children study in a local school; on the other hand, closing the school is hardly to explain economically. Hungarian studies proved, that the per capita costs of small schools are quite high under 100 pupils, but above 200 pupils it is hardly to reduce that. Beside that there is no evidence, that there is significant difference between the efficiency of the smaller and bigger schools. The differences can be traced back on the differences of the educational level of the parents (Bódi & Fekete, 2011). Poverty is connected to the problems of education system.

MacDonald (2003) examined the impacts of school closure in rural Nova Scotian communities. She concluded that school closures, most teachers lived in the same community they taught in. Therefore, parents knew those people who worked at the school and this helped to make the school more accessible to the community. However, after school consolidation parents felt somewhat alienated by the size of the new schools, by the unknown staff and in some cases, by the very distance to the school.

Popa and Acedo (2006) found similar disadvantages of school closure in Romania. Budget cuts shut down schools in rural areas, making it hard for children living in isolated villages to reach

school. Many highly ranked teachers left the schools and were often replaced by under-qualified beginners.

Lyson (2002) summarizes in his study why it is necessary to document and quantify what a school means to small rural villages. This paper draws the attention of policymakers, educational administrators and local citizen focus on the importance of schools to the appropriate operation of rural communities. It is established that the presence of a school in small villages is associated with many social and economic benefits, like higher housing values, more developed municipal infrastructure and so on. Therefore, the author concludes that the gain of a school consolidation can be lost in decreasing taxes, declining property values and lost business (Lyson, 2002).

Autti and Hyry-Beihammer (2014) examined school closures in Finland, focusing on the social role of small village schools. The number of school closures has remained high since 1992, and the number of small schools has decreased significantly. Their interviews illustrated that local residents were unanimous about the significance of village schools. A safe, small school is fundamental to a pleasant community. The school is more than just a place to educate children; it influences the community's well-being. In addition to building human and cultural capital, schools build and maintain social capital. Schools in rural areas are centres of village social life and have a crucial role in constructing a local identity (Autti & Hyry-Beihammer, 2014).

Howley et al. (2011) stated that in order to increase the fiscal efficiency and educational quality in many large schools, places instead of consolidation, deconsolidation could be a better solution. They established that the academic and social performance of too large schools was decreasing. They claimed that the benefits of school and district consolidation were overestimated. They went ever further and highlighted smaller schools and districts could suffer irreversible damage in case of consolidation. On the other hand, they also remind us that the benefits of deconsolidation should be judged only on a case-by-case basis (Howley et al., 2011).

2. Data and Methods

The objective of this paper is to identify the community-level characteristics associated with the presence or absence of a school. With the help of different socio-economic indicators the effects and causes of school closures on rural settlements were analysed in this study.

First, an extended literature review was done concerning the impacts of school closure on rural communities in the summer of 2015. Then, it was necessary to determine what the term 'rural' means in our research. The definition of Hungarian Rural Development Program for rural areas was followed in the research. According to this document, those Hungarian settlements are considered as rural where the population density does not exceed 120 persons/km^2 and has less than 10,000 inhabitants. 2,766 Hungarian villages (88% of the settlements) met these requirements.

Then, a territorial database was created from the data of the Hungarian Central Statistical Office. However, only those rural villages were chosen for the analysis, where the population number was less than 2,000, because above that number of inhabitants, schools exist. Therefore, it was decided to focus on that size of settlements. After that, two subsets of data were created to avoid the influence of the population size on the research findings. The first one contained the very small rural villages having population of 500 or fewer, the second one included small and medium-sized villages with population between 501 and 2,000. In 2013 1,062 villages (34% of the settlements) had 500 or fewer inhabitants and 1,233 villages (39% of the settlements) had a population between 501 and 2,000.

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Demographic, employment, welfare, housing and infrastructure indicators were selected for the analysis. Secondary data for the analysis were mainly obtained from censuses and some other territorial databases. The data processing was made by using statistical methods, applying Excel and SPSS programs.

3. Results and Discussion

3.1. Social circumstances of school closures in Hungary

Despite differences in size and the presence or absence of a school, the demographic characteristics of the Hungarian rural villages concerned are quite similar (Table 2). For instance, the age structure and the school qualification are almost the same in very small and medium-sized villages. The research proved that the absence of schools is more typical in very small-sized villages than in medium-sized ones. It can be seen in Table 2, too, that the average population number was much larger in those villages where at least one school operated in 2013.

Table 2: Population characteristics of the examined Hungarian villages

Population Characteristics	**Population 500 or under** (N=1,062)		**Population 501 to 2,000** (N=1,233)	
	School (N=78)	**No School** (N=984)	**School** (N=941)	**No School** (N=292)
Average population number (capita), 2013	405	256	1,148	720
Average net migration rate (‰), 2013	-6.8	-8.0	-1.9	-4.5
Average natural increase or decrease (‰), 2013	-7.3	-8.3	-5.9	-9.6
Age structure of the population (%)				
18 years old and under (%), 2011	20.5	18.0	19.7	18.5
19-39 years old (%), 2011	28.6	27.6	29.5	29.1
40-64 years old (%), 2011	33.8	35.4	34.4	35.0
65 years old and over (%), 2011	17.0	19.0	16.4	17.4
Ageing index (%), 2013	126.7	178.9	119.9	142.7
Proportion of families with children (%), 2011	65.8	63.5	66.2	65.8
Fertility rate	1.9	1.8	1.8	1.7
School qualification of the population (%)				
didn't finish primary school (%), 2011	19.0	16.7	17.0	15.7
primary school (%), 2011	36.8	37.6	33.5	32.9
secondary school (%), 2011	38.7	40.6	43.0	44.7
graduated (college, university) (%), 2011	5.5	5.1	6.5	6.7

Source: own calculation and edition based on HCSO Census, 2011 and HCSO TSTAR, 2013

Most examined Hungarian villages experienced decline in population in the last two decades. The average net migration rate was negative in each type of settlements, so more people moved out of the villages than moved in. However, it can be stated that in case of villages with schools had more favourable values than settlements without a school. The situation was the same in case of natural decrease and age profile of the population as well. The proportions of children and young adults were higher and the proportion of middle-aged and pensioners were smaller in communities with schools. The ageing index was also unfavourable in each type of settlements, but it can be stated that the worst values have the small villages without schools. It

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turned out that the fertility rates and so the proportions of families with children were higher in settlements with schools (Table 2).

The research outcomes regarding school qualification of the population were ambiguous. The proportion of those who did not finish primary school was higher, while the proportion of people having secondary school certificate was smaller in villages with schools. The ratio of graduated was higher in very small villages with schools, while it was smaller in small and medium-sized villages. The ratios were just converse in case of primary school leavers (Table 2).

3.2. Economic circumstances of school closures in Hungary

The examinations revealed that the presence of school was associated with appreciably smaller proportion of employed and inactive earner and higher ratios of unemployed and dependent compared to similar sized communities without a school (Table 3). It was shown that proportion of workers who commute was much larger in villages without a school.

Table 3: Employment and Welfare Characteristics of the examined Hungarian Villages

Employment & Welfare	**Population 500 or under** (N=1,062)		**Population 501 to 2,000** (N=1,233)	
	School (N=78)	**No School** (N=984)	**School** (N=941)	**No School** (N=292)
Economic activity (%)				
proportion of employed (%), 2011	31.3	32.9	34.8	35.9
proportion of unemployed (%), 2011	7.5	6.7	6.5	6.1
proportion of inactive earner (%), 2011	34.3	37.8	33.2	33.7
proportion of dependent (%), 2011	27.0	22.6	25.5	24.3
Proportion of workers who commute (%), 2011	48.5	62.7	17.7	30.0
Per capita income (HUF/capita), 2013	551,926	562,891	626,429	648,066
Per capita income from wages (HUF/capita), 2013	516,375	520,315	589,699	609,492
Per capita income from regular social assistance (HUF/capita), 2013	2,577	1,808	1,672	1,333
Average number of people receiving regular social assistance (people), 2013	3.3	1.5	6.0	3.1

Source: own calculation and edition based on HCSO Census, 2011 and HCSO TSTAR, 2013

Probably as a consequence of higher proportion of employed, the income per capita from wages and other sources was also higher in settlements without a school. In contrast, the income from regular social assistance was higher in communities with schools. In accordance with this tendency, the average number of people receiving regular social assistance was much higher in such villages (Table 3.).

As it was expected, the housing stock in rural communities with schools was somewhat newer and in line with this fact the proportion of houses with all modern conveniences was higher than in those without schools (Table 4).

Table 4: Housing and Infrastructure Characteristics in Hungarian Villages

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Housing & Infrastructure	Population 500 or under (N=1,062)		Population 501 to 2,000 (N=1,233)	
	School (N=78)	No School (N=984)	School (N=941)	No School (N=292)
Proportion of houses with all modern conveniences (%), 2011	32.7	31.2	43.1	40.3
Proportion of houses supplied by municipal water system (%), 2011	82.5	83.1	87.3	88.8
Proportion of houses supplied by municipal sewer system (%), 2011	26.9	28.7	43.3	46.7
Proportion of houses built after 1990 (%), 2011	10.0	9.7	13.5	12.0

Source: own calculation and edition based on HCSO Census, 2011 and HCSO TSTAR, 2013

However, the research findings concerning the infrastructure were different what had been expected. The examinations proved that rural villages without schools were somewhat more likely to have municipal water system and sewer system than those without schools. So according to the results with the exception of houses the physical infrastructure is more developed in communities without schools than those that have schools (Table 4).

Balázsi and Bódi (2011) examined whether there was no demonstrable link between the school closures and the physical characteristics of the schools. In the environment of consolidated schools there were another school, which was available for the parents. There was no significant correlation between the infrastructural condition (location inside of the settlement, the condition of the school building) and the evidence of school closure. Larger communities took much likely into consideration the socio-cultural background of the families concerned. On the settlements where schools were closed, the social background of pupils was unfavourable and the efficiency of the school was lower.

4. Conclusion

The decline of birth rates has contributed to the consolidation of schools in Hungary. Besides, the enforcement of the new Education Act speeded up closing rural schools.

Rural school closures usually affected negatively the villages. Rural places have more chance to become isolated and lose local identity and the ability of future development activities due to closing the local school.

There was a goal to identify the community-level characteristics associated with the presence or absence of a school. With the help of different socio-economic indicators the effects or causes of school closures on rural settlements were analysed. It can be however concluded that in case of Hungary the better socio-economic situation of villages with school is not clear. The villages with schools have better demographic performance, partly better living and infrastructural conditions, but the employment and the welfare characteristics are worse, compared to those without schools. Further researches are needed to find an explanation for these findings.

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Covasna county in the mirror of economic, social, environmental factors

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Abstract
Globalisation means new challenges to Covasna County's economy, society and environment. We can observe regional disparities and unresolved economic and social problems in the region. Sectors, which represent the province's competitive advantage, such as a medical tourism, agricultural production, need further improvements in order to encourage real economic growth. For inducing development in the economic space the improvement of good quality infrastructure, businesses based on local resources and the innovation are essential. Covasna County is rich in environmental values, which are important to be managed in a more targeted way, due to the increasing value of untouched nature, clean air. The local initiatives increase the value of both rural and urban space and contribute to the increase of attraction of the space; however, in order to promote real economic development of the area, the needs and expectations of the region must be taken into account and competitive products must be created. Covasna County cities are now competing for investors, external resources and to obtain development resources. In this process the economic, social and environmental aspects of cities are very important. These factors greatly affect whether Covasna county cities get to the winning or the losing side of the competition. It is a great challenge to highlight the unique values of a region and further develop competitive advantages from them.

Keywords: *regional disparities, sustainability, competition, local resources*

JEL Classification: *GE11*

1. Introduction

The economic, social and environmental challenges of globalisation had a great impact on Covasna county in the 21th century. The current situation, since the economic crisis in 2008, can be characterised by **growing regional inequalities** and **unsolved economic problems**. In our opinion the path of development is determined by new conditions and challenges. One of the development opportunities of our society is the proper management of common financial and other types of resources (GYÖRGY, 2007; KÁPOSZTA-NAGY, 2014; KÁPOSZTA-NAGY, 2015).

The current topic was chosen for analysis due to the fact that a development process have started recently, which does not have the same impact on all the parts of Covasna county; there is a significant disparity among its settlements, and the reason behind this process is a complex interrelation of economic, social and environmental factors. During our investigation it was our goal to shed light on these processes in Covasna county, to analyse these economic, social and environmental factors and to investigate the development strategy of Covasna county. This way an objective side could be established about the development level of the county, and also about the trends and possible future changes.

1.1 The general introduction of Covasna county

The total area of Covasna county 3,705 km^2 and it lies in the mid-areas of Romania, being part of the Central Development Region. It is the smallest county in its region of Romania considering both its population number and size. There are five larger towns in the county:

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two with the rank of municipality – Sepsiszentgyörgy and Kézdivásárhely –, and three others, namely Covasna, Barót és Bodzaforduló. There are 40 smaller towns and 122 villages in the county as well (BOTOS, 2005).

The county has a large agricultural area, which is more than half (50.3%) of the total area. The majority of the population (210,000 people based on data from the census of 2011) lives in rural or near-rual areas, and 109,366 of them live in rural areas. The population density of the county is 55.6 people per km^2, which is lower than the country average. From a nationality perspective 22.09% of the population are Romanians, 73.59% are Hungarians, 3.99% are roma, 0.05% is Germans and 0.1% has other nationality (insse.ro, 2015).

The economy of Covasna county is an open one with competition between the actors of the economic sphere. The amount of GDP produced in Covasna county fluctuated between 2007 and 2014, similarly to the economic situation of the whole regions.

Table 1: The amount of GDP produced in Romania, in its Central Development Region and in Covasna county *LEU million*

	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Románia	514700	501139	523693	556708	585239	623314	660568
Központi	57303	57100,9	59120,1	63669,2	67889,6	72266	76570,6
Covasna	4042,3	4030,3	3839,1	4068,4	4177,3	4451,6	4709,1

Source: National Institute of Statistics (INSE), 2014

The number of employed people was 45,858 in May 2014, from which 24,000 worked in the industry or services sectors, 20,000 in the field of construction and the rest in the agricultural sector. The net income in Covasna county was LEU 1,241 in May 2014, which is 26% less than the country level average net income (LEU 1.682). The total annual revenue of the companies found in Covasna county is EUR 1.1 billion based on data from the National Institute of Statistics (morfondir.ro, 2014). Land use categories of the county are divided as follows: arable land (22.5%), pasture (16.5%), meadows (11.0%), vineyards and orchards (0.3%), forests (44.5%), water surfaces 5.2% (2009) (insse.ro, 2014).

The most important plants produced in the county are the following: cereals, sugarbeet, potato and vegetables. Compared to the country level, Covasna county produces 1.27% of cereals, 19.05% of sugarbeet, 9.25% of potatoes and 0.76% of the vegetables from the total production amount. The total production value in agriculture on country level is LEU 76.5 billion, from which the county produces 1.73%. From the total animal husbandry production value Covasna county accounts for 1.52%, and from the plant production this value is 1.83% (morfondir.ro, 2014).

The length of the road network in Covasna county is 840 km (road density: 22.6 km per 100 square kilometers). The length of the railway network is 116 km (insse.ro, 2014)...

Covasna county possesses 1.8% of the total tourism and catering units of Romania. 65.93% of its tourist accomodations are boarding house, 16.48% are hotels and 5.49% are motels. From all the accomodations in the country the county has 1.45%. The main forms of tourism are: medical tourism, rural tourism, mountain tourism, cultural- and free-time tourism.

2. Material and methods

The study deals with the complex space of Covasna county from economic, social and environmental perspectives; therefore, the spectrum of the analysis is very wide.

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The basis of the study is the review of literature dealing with previous investigations in similar topics regarding to this region.

The other main source was the statistical data. The source of economic and social data was mainly the Romanian National Institute of Statistics. These factors were investigated from the time period between 2007 and 2014. Besides the statistical data we analysed literature about Covasna county and the Central Development Region. The development strategies prepared for the region, the county and the towns with special attributes got greater emphasis. To shed more light about the situation of the county, the situation of the whole region and the country was analysed too, to establish the background of the situation analysis.

We prepared and used questionnaires, as well as SWOT analysis for our regional analysis. From the data gathered the study focuses on those deemed the most relevant. Zipf formula (about the rank and size of settlements) analysis and Lettrich-type employment structure categorisation were also conducted to see interactions between towns inside the county.

3. Research results

The development level of a region is affected by complex economic social and environmental factors. During the investigation regarding to Covasna country we intended to find out more about these impacts.

3.1 In urban environment

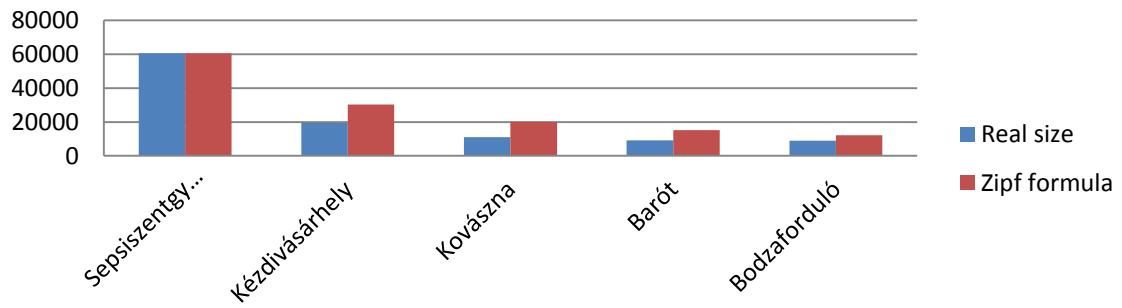
There are five towns inside Covasna county, from which two, Sepsiszentgyörgy and Kézdivásárhely, have municipality rank.

Judging by the economic characteristics of the towns we can establish that their economic roles and weights are changing. Industries employing significant amounts of people disappeared, became insignificantak or transformed, which resulted a steep increase in the unemployment levels and economic development halted (RITTER, 2014).

By using the Lettrich formula we could see how the employment structure has changed and that which categories the local towns belong to according to their most important economic sectors. Based on the available data we can state that the tertiary sector took the leading role in the county, having more employed persons than industry.

There are 109,119 people living in towns in the county, which is 49.41% of its total population. The rank-size rule (Zipf-formula) was applied to these towns to investigate the relationship between their sizes and ranks (Figure 1).

Figure 1: The values and the values provided by the Zipf formula shown by the towns of Covasna county



Source: The authors' own editing based on data from National Institute of Statistics (2014), 2015

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Based on the rank-size rule it can be established that the town structure of Covasna county is a primacy type network, because the real values stayed below the values the Zipf-formula produced.

It is typical for primacy type networks that:

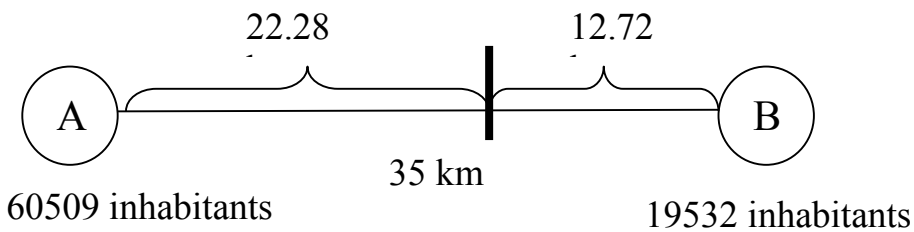
- settlements of such networks have not been urbanisaed for long,
- they have relatively simple political and economic structures,
- the past their dominant settlements are very significant (NAGYNÉ MOLNÁR, 2014).

The towns of Covasna county are also historical micro-regional centres (Sepsiszék – Alsóháromszék – Sepsiszentgyörgy, Kézdiszék-Felsőháromszék – Kézdivásárhely, Orbaiszék – Covasna, Erdővidék – Barót), were the administrative and economic functions are focused. These towns, being part of the same settlement-network, have strong relationships with each other and with the smaller settlements in their environment, but also with settlements outside the border of the county.

Every settlement has a certain gravitatin power based on their resources. The towns of the county differ judging by their economic development levels and population numbers as well. With the help of a gravitation model we could analyse the gravitation power of the county seat and the other towns. In the current study the gravitation effects between Sepsiszentgyörgy and Kézdivásárhely, and between Sepsiszentgyörgy and Barót, are demonstrated.

A- Sepsiszentgyörgy

B- Kézdivásárhely

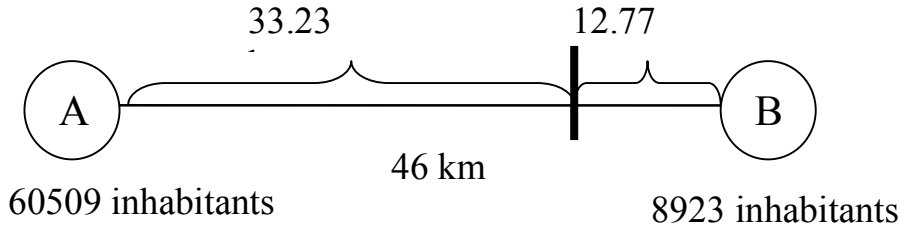


The distance of the threshold from town B = $\frac{\text{distance between towns A and B}}{1+\sqrt{\frac{\text{The population number of settlement A}}{\text{The population number of settlement B}}}} = \frac{35\text{ km}}{1+\sqrt{\frac{60509}{19532}}} =$

$\frac{35}{2{,}75} = 12{,}72$

A – Sepsiszentgyörgy

B - Barót



The distance of the threshold from town B = $\frac{\text{distance between towns A and B}}{1+\sqrt{\frac{\text{The population number of settlement A}}{\text{The population number of settlement B}}}} = \frac{46\text{ km}}{1+\sqrt{\frac{60509}{8923}}} =$

$\frac{46}{3{,}60} = 12{,}77$

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By observing the results of the gravitation model it can be seen how the population number (social factor) and the geographic position (environmental factor) of a settlement affects its gravitionanal power. Based on the calculations, Sepsiszentgyörgy has the largest gravitational power in Covasna county. The town is at the top of the settlement hierarchy of Covasna county – the county level administrative institutions, the majority of workplaces, the highest level of infrastructure and the greatest attractive power for investors can be found here. The town has a very advantageous geographical situation – it lies 34 km from Brasov, one of the most dynamicly developing city of the Central Development Region. The towns of Covasna county compete for investors, for gaining new (financial) resources. The economic, social and environmental factors are very important in this process. These factors have a great impact on whether the towns of Covasna county get to the winner side of the competition, or become losers.

According to György Enyedi (1997), a successful city is able to change its economic structure, it is based on knowledge-based production and high innovative abilities, it provides technologically advanced environment. It is also a place for decision-making and it possesses a large external network.

3.2 The evaluation of the questionnaires

The questionnaire contained 21 questins. We gathered six types of information, which were categorised as follows: personal data, jobs, employment opportunities, commuting, satisfaction with life quality, development opportunities, the openness of locals and their involvement in development processes.

The survey was conducted in two of the towns: Barót and Kézdivásárhely. 33 questionnaires were filled out in Kézdivásárhely and 23 in Barót.

The distribution of the responders by gender: 57% female and 43% male in Barót, 64% female and 36% male in Kézdivásárhely.

Table 2: The distribution of the population based on education levels

Education level	Barót	Kézdivásárhely
Primary school or lower	4%	
Secondary school	39%	30%
Non-technical secondary school	26%	46%
Higher education	31%	24%

Source: Own data collection via questionnaires, 2015

Table 3: The income levels of the households investigated

Income levels	Barót	Kézdivásárhely
No income	-	-
Below LEU 500	4%	3%
Between LEU 500 and 700	9%	15%
Between LEU 700 and 1000	31%	22%
Above LEU 1000	56%	60%

Source: Own data collection via questionnaires, 2015

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From the responders 68% works in the settlement and 32% works in other areas in the case of Barót. In Kézdivásárhely 64% works in the settlement, the rest is 36%. From the ones employed employed in Barót think that they have a chance to change jobs; in Kézdivásárhely the result was 63%.

When discussing the development opportunities the economic and infrastructural development projects were held the most important ones by the locals.

3.3 In rural environment

The majority, 87.02% of the total area of Covasna county belongs to the countryside (with its 40 smaller towns and 122 villages). We can observe the impact of economic, socal and environmental factors at every element of the rural space.

The majority of the active population of the rural areas commutes to the nearby towns, while the ones working at home work in the agricultural sector (animal husbandry, plant production), and only a very few people try to make a living from operating an enterprise. The human capital of the rural areas is very poor, because people with higher education leave the region to find better jobs and wages. The population of the rural areas is aging.

The natural values are plentysome in the rural space. Biodirversity is high; there are large forests with unique, protected animal and plant species. Many protected natural areas can be found in Covasna county, such as the Rétyi Nyíri Nature Conservation Reserve (which is called the Sahara of Háromszék by Balázs Orbán). Well springs and unique natural landscape elements are not unusual either (such as the Almás cave in Vargyas).

There is a large extent of built cultural values in the region as well, such as mansions in Bikkfalva and Réty, szekler gates, monuments and churches (for example, the church of Gelence with paintings about Saint László; tge church of Szacsva from the 14th century; the castle-church of Illyefalva and the church of Vargyas.

The values and opportunities of the rural areas in Covasna county are not utilised properly by the local communities. Although these elements would provide perfect basis for rural- or medical tourism, the locals are not prepared to use them appropriately due to the lack of expertise and capital.

3.4 The evaluation of the questionnaires

From the rural settlements 20 questionnaires were filled out in Előpatak 20, 15 in Kézdialmás, 12 in Réty and 11 in Szacsva. The reason why these settlements were surveyed is the following: Előpatak, Réty and Szacsva belong to the gravitational area of Sepsiszentgyörgy, and Kézdialmás belongs to Kézdivásárhely's (which are the two most developed settlements in the county).

The surveyed settlements have uniques resources. Előpatak is famous for its excellent well springs, which were famous even in the 19th century of Europe. This fame has faded since then, however, because the current political system moved the medical institution from this settlement to some other place.

4. Conclusions

During the investigation of the urban and rural areas of Covasna county our aim was to analyse the complex impacts of the economic, social and environmental factors.

The level of economic development is affected by the social problems, and this process is further affected by environmental characteristics (NAGY, 2009). Economic, social and

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environmental factors of the settlements also have great impact on their abilities to compete for financial resources. The **success of the settlements** of Covasna county depends on their ability to utilise **local resources**, the way they can develop their natural and built environment, their ability to improve their **human resource**, and the way they utilise European Union and national financial resources for local development. Local governments.

The county has towns being more disadvantageous than the others. One of them is Barót, which faced unemployment and decreasing economy after its coal mine was closed. This resulted its separation from more developed towns and cities (Sepsiszentgyörgy, Brassó) and worsening infrastructural endowment. Measures to attract and create new enterprises brought success initially, but economic units not preferred by the European Union (especially in the field of meat production) closed. Kézdivásárhely has better economic endowments, but a large scale economic reconstruction was brought about here, which resulted better infrastructural endowment by now, more openness from the people and better environment. However, we can find significant problems due to the emigration of youth (especially well-educated ones) in both investigated economic spaces.

One of the primary problems of the **rural space** is the lack of great volume investments (due to low-level infrastructure); therefore the local financial resources are not abundant. In the case of rural settlements along international roads and railways we can observe more activities aiming to stimulate the economy. The level of expertise, their knowledge and enthusiasm to develop local communities of settlement leaders contribute a great deal to the development of settlements and to achieve sustainable development.

Kézdialmás is a positive example for the previous phenomenon. Thanks to the cooperation of the management and the civilians the settlement could initiate proper development activities.

Measures aiming to support local farmers were carried out, beside the creation of local enterprises. Also, the built environment and infrastructure have also been improved recently, thanks to mainly EU and national financial support.

One of the negative examples is Előpatak, which used to be famous for its medical tourism, having a fully equipped and renovated medical center; however, due to higher level political decisions the institution has been moved to another place. The current (much smaller) medical center was built as part of the Borvizek (wine-waters) project which included many settlements from Hargita and Covasna counties. The local environmental endowments are advantageous, but there is no sufficient economic and social capital for settlement development. The other great challenge is a social one; namely, the integration of roma people, who are usually either unemployed or have little to no qualification in the settlement. The revival of medical tourism and establishment of new accomodations could be one of the possible ways to revitalise the settlement. By the initiation of EU funded trainings the local roma people could also be involved in the production of crafter products, which would result an increase in their life quality as well.

Réty is a very advantageous settlement regarding its geographic position and natural values (Nyír Natural Reserve of Réty, touristic attractions); however, it cannot be characterised by economic development, because the locals are not open to tourism as much as it was needed. The settlement is very close to the county seat, the population in active age commutes there.

Szacsva has very weak social and economic indicators, but it also has great environmental potential. It would be suitable for establishing processing and production plants, which could provide jobs for locals with lower education levels.

It was usual during the investigation to see how low the economic performance and how high the unemployment is in Covasna county. Inequalty occurs not only between counties, but

between settlements as well. It can be observed on county and regional levels that more developed areas, such as Sibiu, Brasov and Mures counties have higher level infrastructure network than others, which is an advantage in finding investors and capital. The infrastructure in Covasna county is very lacking; it is satisfactory only in Sepsiszentgyörgy and Kézdivásárhely, but even they require improvement. The infrastructure of smaller towns, such as Barót, Covasna, Bodzaforduló and rural settlements is urgently in need for improvement to be more attractive for investors. Social capital is decreasing due to the fact the youth with higher education leaving the area, which means it is one of the most important tasks to keep them in the county by making it more attractive for them. This way, settlements would be even more attractive for investors and new kinds of jobs could be created besides the ones using workforce with low qualification (with lower wages). That would eventually lead to an increase in the **welfare of the population**.

There has been only very few **research and development** activities in the county in the investigated time period. This topic must be focused on in order to make rural areas more attractive for highly qualified people. The IT sector must be emphasised as well, since it is not yet significant in Covasna county, but it proved in other regions that is could bring about robust growth. The natural values of the county get increasing appreciation as well from the locals, which process is supported by non-governmental organisations as well, which can carry out small-scale programmes with EU support. One of these programmes is the Sepsi Green Way programme, which ties together 19 settlements in Covasna county in order to encourage the locals and tourists as well to visit and appreciate natural and cultural values in the area.

Beside the negative results, it was found that the county has many strong sides as well. These elements were the agriculture (with competitive potato and sugarbeet production) and tourism (medical tourism, the cardiology institute in Covasna, Sepsiszentgyörgy with its rich cultural programmes, such as the annually organised and internationally famous Saint George days, exhibitions and theatrical performances, etc.).

The **local initiatives** increase the value of both rural and urban spaces. Also, they contribute to the attractiveness of regions. However, to support economic development the needs of the region are must be observed as well, and competitive products must be created as well.

The effects of economic, social and environmental factors of settlements can only lead to development if utilised properly, rationally and efficiently.

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A few notes on the study of short food supply chains on the example of farm boxes in the Czech Republic

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Abstract
Besides other topics, foreign scientists (agricultural economists, rural geographers, geographers of agriculture/food) especially from Western Europe and the U.S.A., pay attention to the development of short food supply chains (SFSCs)/alternative food networks (AFNs) in the long-term perspective. Such schemes were established as one of the substitute options of food distribution in the space of "traditional forms" of food distribution and consumption. With view to the actual dramatic development of alternative food networks in the Czech Republic, it is not surprising that in a recent period, a number of studies shift attention to this issue. Most studies are focused on the development of short (food) supply chains, particularly farmers' markets and direct sales. Because SFSCs/AFNs are a relatively current topic and an unexplored concept in many characteristics, the authors of the presented paper use the example of the box scheme (the so-called farm boxes) to describe selected aspects of its development in the Czech Republic while applying geographic, agroeconomic and marketing approaches. The analysis is based on data of specialized web databases which actors of the box scheme use to offer their product via on-line channels. First results reveal a regional differentiation of farm boxes in the Czech republic, relationships between customers, headquarters and supply points and differences in the nature of the product (for example the range of offered commodities...) and its management.

Key words: *short food supply chains, alternative food networks, the Czech Republic, box schemes, regional differentiation*

JEL classification: *Q02, Q13, R12*

1. Introduction: Short food supply chains

In the end of the 20th century, the Czech Republic had undergone a significant transformation, which resulted in transition from central planning economic model to the market economy model based on market liberalization. The demand side has become the dominating side of the market model, determining and managing the direction of product offerings in the market (including the food consumption). The disintegration of the previous system eliminated barriers to entry on the Czech market and thus the arrival of a new segment - wholesale chains was enabled. In a short period, wholesale chains dominated a large part of the food market since they offered a single-volume sale, with a wide range of products at low prices, and local retailers could not compete with them. These chains have become a dominant player in the market, however, at the expense of small retail shops.

The dynamics of development of the Czech grocery trade corresponded with the changes in the food-farming system and partly copied the development in the developed countries of Western Europe. In these countries, some disadvantages of agricultural system began to reveal, such as overproduction, increasing environmental pollution or degradation of food security/quality. Therefore, distrust in the quality of the food produced in the conventional farming and the genetic modification of food, known as GMOs, taking into account other negative factors, such as the occurrences of diseases, e.g. swine or bird flu, salmonella and other (Renting, Marsden & Banks, 2003), were considered as important factor influencing

consumer perception. But according to Maples et al. (2013 in Low et al., 2015), in a survey of consumer trends in the United States of America (USA), the safety of food was not proven to be the most important factor in buying local products, rather it was the knowledge of their origin. Zepeda and Nie (2012) further state that according to a survey of trends in the USA in 2011, 27% of respondents were concerned about the environmental impacts of imported products.

The increasing consumer demand for quality and awareness of food origin (which may be reflected in the rejection of the conventional ways of producing and selling food in large-format stores) resulted in searching for alternatives to food distribution, such that would meet the requirements of quality and of locality (Fendrychová, Spilková & Syrovátková, 2013). A new understanding of food in the eyes of consumers was generally supported by the increasing public interest in areas, such as the environment, health and welfare (not only in connection to the population).

Therefore, geographers, rural sociologists and agricultural economists pay attention to this trend and describe the short forms of distribution of the food chains including newly formed network of producers, consumers and other stakeholders. These concepts represent alternatives differing from standard systems food chains (Murdoch, Marsden & Banks, 2000). One of the described types of food network was based on the face to face approach, when consumers buy products directly from producers and their confidence was based on the personal approach (Holloway & Kneafsey, 2000; Knickel & Hof, 2002; Pretty, 1998 quoted in Renting, Marsden & Banks, 2003). The types of short food chains, such as mail order, internet advertising and box schemes (farm boxes) use this marketing concept; this paper singles out the issue of box schemes.

The concept of these networks has been taken from Western European countries and adapted to the conditions of the Czech Republic (Zagata, 2012). The author also describes, although even now wholesale chains still dominate the Czech market, food production and consumption, their market position start to change because new trends as changing lifestyles and attitudes towards food. In the Czech Republic we can already find farmers' markets, box schemes, community-supported agriculture, and other forms of alternative food network. Farmers' markets were first introduced initiative (Spilková & Perlín, 2013). After the introduction, farmers' market gained popularity and served as a template for framing the rules of functioning structures for newcomers to the industry. Demand for these forms of sale spreads very quickly and continues to rise, documented by the increasing number of groups and communities that support this type of production and sales. Therefore, Zdráhal and Bečvářová (2013) state that these networks are now being seen as tools that have the potential to mitigate the effects of restructuring in European agriculture and would support to small agricultural producers.

The concept of box schemes is diversified and varies in the range of characteristics - according to the operator, methods of payment, risk sharing and other attribute. Also, bond and mutual relations among the both sides may be different. It depends on farmers (or responsible cooperatives) and customers what kind of relationship will be applied.

The aim of this paper is to evaluate the development and the characteristics of the selected segment of SFSCs ie. box schemes in the Czech Republic; especially spatial context and typology in terms of management and assortment of box schemes are analyzed. Given the limited scope of this paper, the objective is recognized only as a basic overview of the captured results. Because studies that would provide a more comprehensive characteristics box schemes in the Czech Republic are not available, the research questions are focused on selected basic characters, whose understating is necessary for further research in this area.

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- How is (spatial) localization of box schemes in the Czech Republic?
- What are the differentiating features of box schemes according selected characteristics (origin, range of offered products, delivery)?

2. Date and methods

Data analysis was based on information of "box schemes community of Bohemia and Moravia" in the online website bedynky.cz (October 2015) (PRO-BIO League). Web captures cooperatives in the Czech Republic and database collects available information about the subjects. Information of the "community that supports local production and consumption" (nalok.cz) was used as an additional source. Created database of box schemes cooperatives was served for a deeper analysis. Group of "regional box schemes" (92) was identified, which included cooperatives with supplies only in the one region and the "national box schemes" (20), which accounted entities operating in several regions.

Characteristic of spatial distribution of cooperatives was based on knowledge of the municipality location of the seat of cooperatives. Information about way of the foundation (by farmers or consumers) was also taken into account. The box schemes cooperatives, which were difficult to determine according this attribute, were grouped as unclassified.

Another part of work was designed to evaluate box schemes types according to the classification of offered agricultural products and its range and method of distribution (possibility to deliver to a given address). Given the possibility of wide variation of product assortment has been divided into 7 categories, including dairy products, meat, eggs, vegetables, wine and alcohol, honey, fruit juices and syrups. Based on the determination of the frequency of each category cooperatives were divided into three groups according to the width of the range: wide range (1), narrow range (2) and specialized cooperatives. Specific key to the division into categories was as follows (two cooperatives could not be classified in any of the groups).

- The cooperatives, which were focused on one food categories, were included in the group of specialized cooperatives.
- Conversely, those operators that offer products in two or three categories, were classified as a narrow range.
- The third group is created, those cooperatives which are characterized by a wide range of offered food (offering four or more food categories).

3. Results and discussion

Box schemes initiatives grow as fast as other sectors of short food supply chains in the Czech Republic. While in the early years (2010) around 40 organizations were reported, in 2015 numbers of them rose to more than 100 cooperatives. During this time their numbers recorded dynamic development, which was characterized by their demise and the emergence of new co-operatives too. At the time of the presented research 112 box schemes cooperatives was captured and analyzed (October 2015).

Most of the cooperatives operate in regional scale. Cooperatives operate in more than one regions of the Czech Republic ("National cooperatives"), were represented only by 21 subjects and in average, each of them operate in 2.5 Czech regions. The importance of cooperatives operating in the two regions (15 subjects) was the higher; four of these cooperatives operate in three regions, one in four and one even in 7 regions. The cooperative, having the greatest coverage of the Czech Republic in its spatial scope (half of the regions) is

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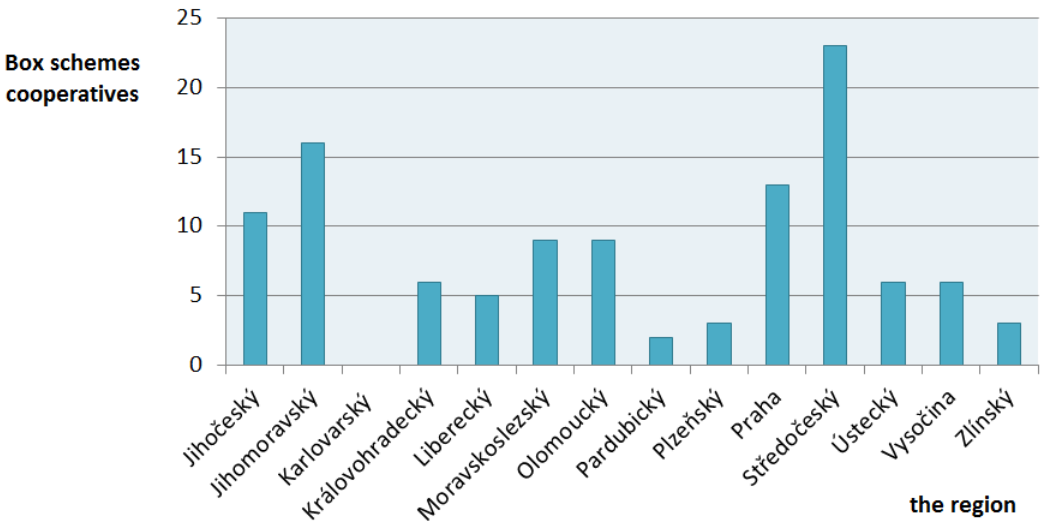
the Biofarm Sasov. The second most common farm is Farma-obchod.cz, which operates in four regions. By contrast, the regional cooperative operates only in one region of the country. Their number is 92, and thus they have a substantial share of the total box schemes. This category of cooperatives is therefore comprises only by subjects that are strongly embodied in their place of residence.

3.1 Localization of box schemes cooperatives

Generally, box schemes cooperatives are situated almost all regions of the Czech Republic. Looking more closely at their localization, it is apparent that they are concerned in the region presented by important regional centres (Prague, Brno, Ostrava, Czech Budejovice, Olomouc), in which they are able to find greater application of its products (the questions of number of consumers, but also purchase power).

Figure 1: Localization of box schemes cooperatives in the regions of the Czech republic



Source: Pro-bio league; nalok.cz; edited by authors

Further, detailed analysis of the location box schemes cooperatives in municipalities where the seat of cooperatives are situated, in order to verify whether box schemes distribution of agricultural products in terms of consumption are directed primarily to major cities in the Czech Republic. As Table 1 shows, although it confirmed that box schemes in the Czech Republic focus on end markets in large towns, concentration of the cooperatives of box schemes is less important. Only 32 monitored initiatives from 112 were located in the municipality where already some other cooperative operate. It means that nearly three quarters of monitored cooperatives operate in the municipality, where there was no competition.

Table 1: Box schemes cooperatives in the municipalities of the Czech Republic

Municipality	Number of cooperatives
Praha	10
Brno	9
Olomouc	3
Plzeň	3
České Budějovice	3
Liberec, Ostrava, Bílá Lhota, Hradec Králové, Litoměřice	2

Source: Pro-bio league; nalok.cz; edited by authors

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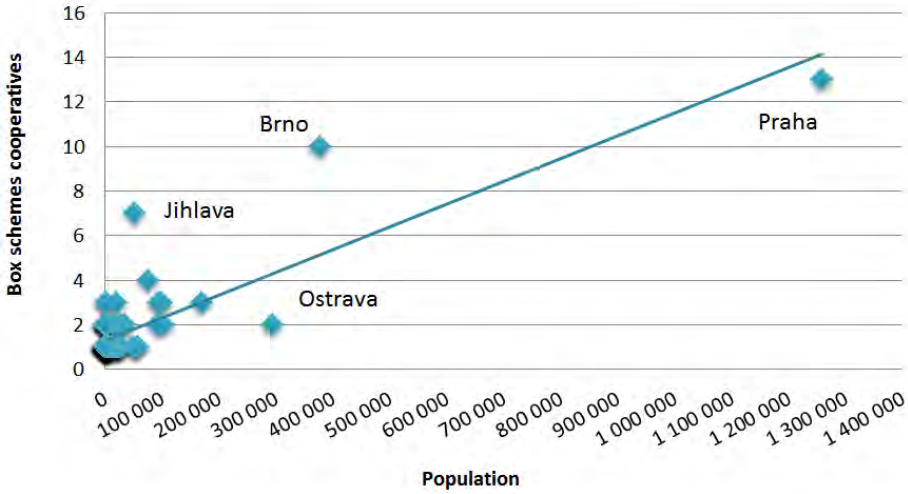
Box schemes cooperatives are predominantly localized in the part of the region, where is also the large consumer market, however, the existence of entities that operate on a much wider area was also recorded. Current practice in these complex systems suggests that if cooperatives decide to expand beyond the region of its origin, it is especially the Prague, which is sufficient for such an expansion motive. Due to influence of Prague, a growing number of cooperatives in the area rose with increasing of population size of municipality where cooperative seat is localized, as following figure reports.

Figure 2: Localization of box schemes cooperatives according popullation



Source: Pro-bio league; nalok.cz; the Czech Statistical Office, edited by authors

3.2 Type of box schemes cooperatives in the Czech Republic

The following analysis is focused on aspects of their formation, organizational methods, a range of offered products and use of external ordering system. For these purposes, the basic set of monitored subjects was divided into three types of cooperatives. The first type is represented by group of a cooperatives established by farmers (identification of boxes with specific farm)(1), consumers (2), and a third type was formed by group, which was not possible to determine whether the first or second classification was acceptable.

3.2.1 Establishment and Management

From the 112 reported subjects, 47 cooperatives were based on the initiative of consumers. A more detailed analysis of this group, however, showed that this group is not homogeneous and the two forms of organization exist, which are differed by aspect of intentions of their founders.

The first type is represented by cooperatives founded and organized by final consumers, when some elected member represents the cooperative. For this type, quality and domestic (Czech) food is very important. Cooperative is founded for the purpose of gathering local food products, which are distributed to their members or other residents in your neighborhood and would encourage healthy lifestyles in the region and small agricultural producers. The second (less frequent) type is presented by business cooperatives, eg. On-line stores (e-shops). Created cooperatives aim to regroup a broad portfolio of products that are offered. The difference between these organizations lies in the purpose of sale of goods, way of distribution and management and general objectives of their establishment. A significant role is also played by distance delivery, when the cooperatives of consumer type deliver only to nearby localities but the online shops supply customers in a greater distance.

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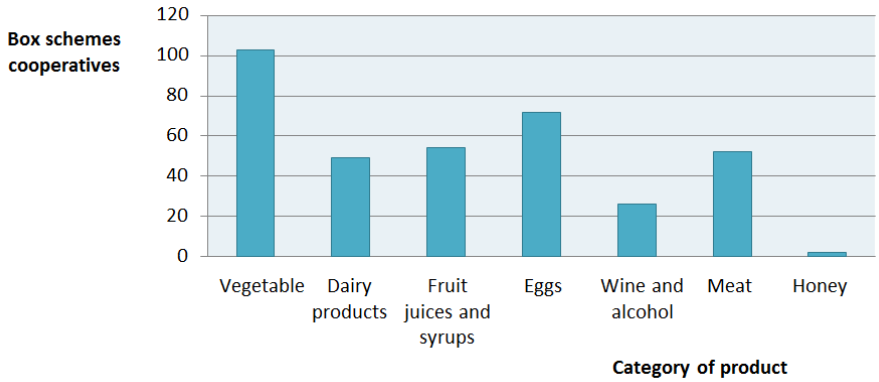
3.2.2 Specialization

An analysis of the offered product portfolio showed that the subject of the exchange of local products were on generalized view foods like fruits and vegetables, dairy products, meat products, fruit juices and syrups, wines and alcohol, eggs and honey (7 different categories of foods). As can be seen in Fig. 3, the most important item that was offered by almost all cooperatives was featured vegetables and fruits. Other products offered in box schemes are represented by no seasonal products, but they were offered in less frequently - especially eggs, meat and dairy products. Another part of box schemes creating a higher added value - wine and other alcohol, was included by only one fifth of initiatives and honey was offered in this scheme only very rarely.

Figure 3: Frequency of product category in the box schemes



Source: Pro-bio league; nalok.cz; edited by authors

According the range of products the most of the initiatives aims to cover the widest portfolio of products. A third of subjects were focused on two or three product types and only one fifth presented the distinct specialty group. According to the origin and the management of cooperatives we can identify different approaches to the range of offered products. The cooperatives formed by farmers mainly focused on a narrower range of products and many of them were specialized. In contrast, the cooperatives initiated by consumers were mainly focused on providing a wide range of products. The smallest group was formed by specializing box schemes cooperatives, which represent 28% of farmer cooperatives and 15% consumer cooperatives.

Table 2: Offered range of products in the relation of type of cooperatives according their establishment

Range of products	Farmers	Consumers	Unclassified	Total	Rel. Frequency (%)
Unclassified	0	2	0	2	1,1
Specialized cooperatives	13	7	4	24	21,4
Narrow range	19	12	6	37	33,0
Wide range	15	26	8	49	43,8
Total	**47**	**47**	**18**	**112**	**100,0**

Source: Pro-bio league; nalok.cz; edited by authors

Results of the regional cooperatives show that they preferred a wide range of products (61% of subjects) while in the case of the national level, the representation of initiatives applying narrow and wide assortment is surprisingly uniform (consisting of 36% for both groups).

The group of initiatives aimed at a wide range of food was oriented on the diversity of offered products because many cooperatives try to offer uncommon foods, or even exotic fruit. In

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addition to local and expectable products, it was possible to find even the less common food. They try to distinguish themselves from others, but also attempt to offer a large selection of food. However, this effort could lead to the fact that one of the primary goals of box schemes and consumer expectations are not fulfilled - the local production and knowledge of the place of origin of the food.

3.2.3 Delivery

Further analysis revealed providing additional services to customers, primarily whether cooperatives also enables distribution of farm boxes directly to customers' homes. Mainly farmers cooperatives are among the entities that do not provide "home deliveries" (47% of cooperatives do not offer this option). As one of the reasons may be named the size of family farms, which are not sufficient and can not cover the costs, which involve distribution. Delivery to home is much more applied in cases of consumer-based initiatives, while 2/3 cooperatives offer this option. For many consumers it may appear as significant the fact that food within the box schemes is transported to their home and they have no concern with their procurement on the withdrawal site.

Despite the potentially strong position, which can be attributed to national cooperatives (due to their extensive distribution network), only 3/5 cooperatives provide delivery. The major part of deliveries in both forms of cooperatives according to the establishment and management are realized in Prague and the surrounding the Central Bohemia Region. In the case of regional level the shares of cooperatives offering distribution and cooperatives without them were close to the total shares and delivery to home was realized in the surrounding of seat of box schemes cooperatives.

There are many reasons that affect the decisions of box schemes actors for the establishment of this service. Influence on decisions about the provision may be largely linked with burdensome factors such as time, resources, finance, and human capital. Thus, some of a cooperatives request compensation payment for this service. Therefore, it is not surprising that cooperatives which do not offer this service are predominantly represented by small family farms than consumers based initiatives. In this type of cooperatives, delivery to home is connected with increased cost for box schemes management.

4. Conclusion

Based on the literature review, several reasons could be identified in the effort to exercise box schemes in the Czech Republic; these can be found either on the demand side (knowledge of the origin of food, quality of locality...) or the supply side (the goal to ensure regular consumption of agricultural products for a „fair price", expand the distribution opportunities of access of local products on market and reduce the impact of business wholesale chains). As the development of numbers of cooperatives involved in the farm boxes scheme reveals, the dynamics of the box schemes environment is high. It can be seen that many players are not even able to cope with the demands placed on the system and consequently, they cease their business activities.

As the analysis of localization of the headquarters of box schemes cooperatives suggests, two types of localization can be distinguished. These cooperatives are established in the vicinity of important cities - location near regional cities gives advantage to such located box schemes initiatives, since city population represents large potential market of short food supply chains and many inhabitants have an experience with the AFNs for example through farmers markets (Syrovátková, Hrabák and Spilková, 2014). The second type is represented by cooperatives initiatives which are set up in areas suitable for farming. While cooperatives which are seated

near major regional cities (Central Bohemia region close to Prague, Ostrava) are formed and initiated especially by consumers themselves, agriculturally favored areas are significant in the case of cooperatives initiated by farmers who manage this land. However, high numbers of consumers who perceive an opportunity to consume the food produced by local farms are also concentrated in the agriculturally favored areas (the Vysočina Region and the South Bohemian Region).

In terms of product range offered by box schemes cooperatives, we can conclude that offer of products is mainly composed of a wide variety of food, especially in offer by consumer cooperatives. Cooperatives established by farmers are focused on a narrower range of food and they are often specialized. Among the most popular product categories, which are present in the majority of the contents of farm boxes, we can identify vegetables and fruits. Other farm products complementing the content of boxes may be eggs, fruit juices, dairy products and meat. Most cooperatives provide additional services for their customers, for example individual delivery of boxes to the specified address. These services represent the extra offers and are often carried out with view to a number of customers willing to pay extra fees in some cases. Therefore, these services are increasingly used particularly by cooperatives initiated and controlled by the consumers.

Even in the case of farm boxes, weak embeddedness of boxes in the minds of consumers and the uncertainty of sales seem to be a disadvantage increasing demand on time and finance. For some cooperatives, these facts constitute a major limitation, and its impact is even larger in the case that box schemes are managed by small family farms or enthusiastic consumers who manage the cooperatives mostly in their free time. In this point of view, significant fluctuations of box schemes cooperatives numbers in the Czech Republic could be explained by the above mentioned limits.

Regarding the presented findings, it is possible to analyze the role the local action groups (LAGs), and more generally of the new rural development program (RDP) in the Czech Republic, in the development of short food supply chains in the future. These activities can be supported by LAGs or RDP generally and many LAGs have already included support of short food supply chains into their project frameworks.

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The state of the agricultural extension in the V4 states and its future development dimensions

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Abstract
Agricultural Extension in Visegrad group since 1990, in significant way had supported the transition of agriculture, as well as its individual members, accession to the European Union. Its institutional capacity building started immediately after political, economic and social changes. Under the impact of the EU accession the systems have been reorganised in 2007, in order to meet EU requirements and adaptation on the cross compliance. With implementation of agricultural extension has been connected great expectations, however there are still in some countries discrepancies which create the barrier for well-functioning and effective institutions which would be able in significant way to ensure the transfer of innovation, to support the trends of growth in the sector and which would be able to involve in dynamic way the all actors into the system's operation. The submitted paper deals with development dimensions of the agricultural extension in the V-4 states, with its main challenges, as well as with comparison of individual V-4 countries among themselves. There are also submitted proposals on the future re-orientation and required prerequisites for more dynamic and intensive development.

Keywords: *advisor, agricultural extension, farmer, innovation, knowledge*

JEL Classification: *E240, O180*

1. Introduction

Agricultural extension and advisory services are central to achieving sustainable and competitive productivity growth in the farming communities. By facilitating farmer's access to information, such services can help to reduce the gap between potential and actual yields and improve farmer's management skills.

Agricultural knowledge and information system (AKIS) indicates a system that links people and institutions to promote mutual learning and generate, share, and utilize agriculture related technology, knowledge and information. The system integrates farmers, agricultural educators, researchers, and advisors to harness knowledge and information from various sources for improved livelihoods. **(FAO/World Bank, 2000)**

Roling (2007), defined AKIS as set of agricultural organizations and/or persons, and the links and interaction between them, engaged in such processes as the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information in given country's agriculture.

The AKIS is in each country different, influenced by legislation, agricultural research, advisory institutions, structure and integration of education systems, the financial support, farmer's needs and their expectations, as well as by the production and organizational characteristics of the individual and commercial farms. Furthermore, the diversity of the advisory system is given by historical continuities and economic development of the

concerned country. While, the progressive development of the number of countries across the European Union (EU) is given by the growing innovations and effectively functioning extensions system, has to be acknowledged that the development of agricultural system in V-4 countries never achieved the required level and only partially supports the transition of progressive knowledge and good experience into the farming practices. In general, it is possible to notice many similarities in AKIS consistency. In the majority of countries the public sector is represented in AKIS as a supplier of information, funding and advisory provider. Sometimes, it combines two or three of these functions.

There are the efforts to slightly adjust the AKIS definition in line with recent trends in the agricultural and rural development. Instead of AKIS, there is tendency to re-name it on the Agricultural innovation system (AIS) which indicates a network of organizations, enterprises and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance.**(Hall et al. 2006)** Definition of advisory services in pluridisciplinary perspective is as follows: Agricultural advisory services as the entire set of organizations that will enable the farmers to co-produce farm level solutions by establishing service relationships with advisers so as to produce knowledge and enhance skills. **(World Bank, 2006b)**

The objective of the submitted article is to evaluate the development trends of the agricultural extension, its strengths and weaknesses, challenges and opportunities upon the comparison in the frame of V-4 countries.

2. Data and Methods

This paper discusses the trends and challenges in agricultural extension and advisory services and their implications for V-4 countries (Czech Republic, Hungary, Poland, Slovak Republic) The main aim of this paper is to provide a comprehensive description of the Agricultural Knowledge and Information system (AKIS) in the V-4, with particular focus on agricultural advisory services. The characteristic includes AKIS description, history of advisory services, public policy, funding schemes, human resources, clients and topics, performing and planning of advisory work and section on how the Farm Advisory Systems (FAS) was implemented.

This paper partly represents an output of the work package: WP3 titled as AKIS in the EU: Inventory which is part of the PRO AKIS project (Prospect's for Farmer's Support: Advisory services in the European AKIS). It is based on common research team conceptual understanding of key issues and structure of national appraisal and on qualitative interviews, diagram and quantitative survey in each EU country. It was partly done by consortium members, partly by other experts. Summative appraisal of single country reports was done by University of Krakow.

3. Results and Discussion

The countries of the European Union are highly diversified in terms of territory, population, society and economy, especially in term of their structure of agriculture; therefore we have picked up only several basic economic indicators to compare V-4 countries.

According to the EUROSTAT there is over 12,2 million of agricultural holdings across the EU-28 working on 174, 1 million hectares of land., there are 1,507 million agricultural holdings in Poland, 0,577 million agricultural holdings in Hungary, 24 460 in Slovakia and 22 860 in Czech Republic. Countries of V-4 represents over 17, 4 % of all agricultural

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holdings in EU-28. Average utilized agricultural area per holding in the V-4 differs significantly. The small number of big farms leads to an unusually high average area per holding registered 152, 38 hectares per farm in the Czech Republic. The farms in Slovakia have 77, 49 hectares per farm. This means high concentration of agricultural land and reduction of agricultural holdings. On the contrary, average utilized agriculture area is smallest in Hungary 8, 1 hectares per farm and in Poland 9, 6 hectares per farm.

Regarding living standards expressed by GDP per capita (Euro) is reported in Czech Republic 14 600 Euro, it means 57 % of EU-27 average GDP per capita. Slovakia is at 52 percent of EU-27 average value, and Poland with Hungary is at 38, 7 percent respectively 38, and 3 percent of EU-27 average value.

Based on data, share of agriculture sector in national GDP it does not differ much within V-4 countries. Slovakian agricultural sector represents 3, 86 percent, Polish agricultural sector stands for 3, 54 percent, Hungarian agricultural sector reached 3, 53 percent and Czech share is only 2, 31 percent in national GDP. Average value of EU-27 is 1, 48 percent.

Establishment of agricultural advisory systems in V-4 comes back to the period of political and socio - economical changes in Central Europe with one exemption, Poland. Agricultural Society of Hrubieszow was established in 1816, and formal agricultural advisory service in Poland started in 1883. The formation of farm advisory service (FAS) in Czech Republic and Hungary has started between 1990 and 1992. In Slovakia, the first agency dealing with agricultural extension was established in 1990.

There are different types of advisory organizations as per their ownership types: public, private, NGOs, FBOs and freelancers. The prevailing type of public (fully and semi-public) advisory organisations is in all V-4 countries. Main suppliers of advisory services in Czech Republic are private advisory organizations, agrarian NGO's, universities and research institutions. Fragmented and un-coordinated system of four main types of advisory actors which operates in Hungary is as follows: free consultancy, subsidised consultancy, commercial consultancy and input providers (private sector). Among main suppliers of advisory services in Slovakia belong research institutes, agrarian NGO's, private advisory organizations and public organizations (Agroinstitut and Institute for Forestry Extension and Education). Advisory system, in Poland, embodies Provincial Advisory Centres – public organization.

Regarding the major target groups by dominant type of advisory organizations there are following clients: (a) for public advisory organizations – medium and small commercial farms and young farmers, (b) for private (for profit and non-profit) organizations – large, medium and small commercial farms, (c) for FBO's – large, medium and small commercial farms and producer's groups. New client have appeared for agricultural services – increasing groups of young farmers, families as a whole, rural inhabitants, newcomers, women and NGO's. The major target groups in Czech Republic for private organizations are large and medium commercial farms and for agrarian NGO's are large, medium and small commercial farms. In Hungary, the targeted groups depend on agricultural service provider, but in general medium and small commercial farms. In Poland, there are medium and small commercial farms and young farmers. Focus is on large, medium and small commercial farms in Slovakia.

With regards to the sources of funding of agricultural advisory services are: public funds (on national or regional level), private funding (direct payments for services from farmers, NGO's), membership fee, production levies, EU funds. The mixed system of financing mainly (public-private) prevails in V-4 countries. Main sources for agricultural extension in Czech Republic are represented by mixed funding for both main advisory providers. Generally, different sources in each individual AKIS level (on 1st and 2nd level are designated

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in the form of programmes, included in national subsidies, 3rd level from RDP (Regional Development Programs) and 4th level from Ministry of Agriculture and web pages owners). Mixed funding works in Hungary, but depends on advisory service provider. Major source of funding in Slovakia is mixed funding. There is funding in the form of national contribution to the farmers NGO's, as well as co-financing by farmers or rural businessmen, in addition to the provided EU funds. In Poland works mixed funding, too. State budget created (2012) approximately 56 percent, funds from other provincial units of public sector secure 15, 2 percent, EU funds presents 1, 2 percent and from service takers makes 25 percent (beneficiaries – farmers, businessmen and farmer's organizations).

Regarding the main topics of advisory services in EU-27 we found there are some variances between the client's clusters. The major topics of advisory services for large and medium commercial farms are plant production, animal production, accounting, taxes, cross-compliance and environmental protection. Small commercial farms are interested in the similar topics plus rural development and diversification issues. Newly recognised topics of advice are bio products, renewable energy, biogas production, water management, natural resources management and biodiversity. Main topics of advisory services in Czech Republic are plant and animal production, cross compliance, environmental protection, stable design and renewable energy. In Hungary, there are following topics: for medium commercial farms the following activities are provided - cross compliance, plant and animal production, and for small commercial farms – plant and animal production. Polish medium and small farms are interested in plant and animal production, book-keeping, cross compliance, taxes, environmental and rural development. Young farmers are looking for advice in area of plant and animal production. In Slovakia, main topics of advisory services touches cross compliance, plant and animal production, environmental issues and rural development

In V-4 countries there is no unified AKIS system. The each country built its own system determined on the basis of legislation acts, ownership of research institutions and advisory organizations, structure of education, sources of financing, characters of farm holder's needs and expectations and implementation of CAP and local agricultural policies. Concerning research and education actors their function in AKIS is not only that they are creators of knowledge and innovation and educators, but they are also provider of advisory services. There are main six AKIS actors: 1. Creator of agricultural policy (government, parliament, institutions, state agencies, local governments); 2. Research and education organizations; 3. Providers of advisory services; 4. Users of advisory services; 5. Producers of input (suppliers); 6. Producers of output (food processors, wholesalers or other enterprises). Research and education institutions deal with generating new knowledge to consistently strengthen the system in the scope of innovation with analyses of efficiency of the applied production technologies, developing new management systems, in particular links to AKIS, as well as comprehensive and specialized education of new staff for all AKIS links.

Czech Republic: AKIS represents a complex system of agriculture advisory services including the transfer of the newest knowledge and information to users. The main parts are the Department of Education and Advisory of Ministry of Agriculture, Institute of Agricultural Economics and information followed by agricultural agencies -13, research and educational institutions (institutes – 4 and universities – 3), private consultants – 264, chambers – 2, farmer group – 2, agricultural holdings and producer's organisations – 22 860. There are tools in the frame of the system for synergic operation between all parts actors. There is strong relationship and rather formal cooperation between actors at particular levels, formal and informal cooperation between levels and personal linkages and networking are additional benefits of system.

Hungary: AKIS consists of following actors-Ministry of Rural Development, 16 research institutes and 7 universities, 97 private consultants, 1 chamber and 576 810 agricultural holdings as producers or users. Present market potential for commercial advisory services in Hungary is very limited. Large farms have their own advisors and do not use agriculture advisory. Very small farms do not seek technical advice. Farmers cannot see benefits only the costs. Specialist advisors which operate within FAS are under-employed because demand for their services is at low level. There is lack of trust between farmers and advisors in terms of inconsistent quality of provided services. Cooperation within AKIS is characterized by weak relationship among the actors and must be improved in terms of knowledge flow.

Poland: There are following main stakeholders of AKIS: Agricultural advisory organisations are represented by 1 Agricultural Advisory Centre, 16 Provincial Advisory Centres, 16 agricultural chambers and 163 private advisory organizations and NGO's. These actors cover wide spectrum of educational, environmental, ecological, developmental and cultural activities. Advisors mainly deal with market information, promotion of agricultural, economics and organizational innovations, constant education and solving the problems. Research and Education contains 13 agricultural research institutes, 10 universities of agriculture or life sciences, 15 colleges and 45 secondary agricultural schools. Scientists and teachers deal with generating new knowledge to strengthen the system in the scope of innovation. Agricultural policy actors include Ministry of Agriculture and Rural Development, Ministry of Environment, Ministry of Finance, Ministry of Science and Higher Education, 2 parliamentary committees for agriculture, 3 state agencies, 5 state inspections, 16 provincial governors and 314 country districts. Politicians, administration officials and inspector are responsible for agricultural policies, quality, health, safety, environmental protection etc. There are 1, 506 million of agricultural holdings as users. There is different quality level of relationship between AKIS actors. Very strong cooperation is between farmers and advisory organisations. Strong cooperation is between farmers and suppliers of inputs, farmers and sales, advisory actors and research and education actors, advisory actors and agricultural policy makers.

Slovakia: Within AKIS, organisations and institutions are inter-connected in order to generate new knowledge, share experiences and transfer it among themselves with the aim of introducing it into agricultural and rural practises. AKIS includes following main actors: Ministry of Agriculture and Rural Development, 2 agencies (Agricultural Paying Agency and Rural Development Agency), 5 research institutes and 4 universities, 14 private consulting companies, 27 independent consultants, 2 farmer's group, 2 chambers and 74 600 agricultural holdings as users. The specific national agreement about integration of knowledge exchange does not exist among AKIS actors. There are agreements on the targeted budgetary allocations and these agreements include paragraphs which are referring to responsibility of respective institutions towards knowledge exchange and information sharing and transfer of innovations and new technologies within existing institutional frameworks. Despite the integration of organisations in relation to research and advisory, as well as links among the farmer's community, were not successfully developed after EU accession. From this point of view AKIS system does not function well where cooperation is not strengthened from policy makers.

4. Conclusion

The main objective of this paper is to provide a comprehensive description of the Agricultural Knowledge and Information system (AKIS) in the V-4 (Visegrad group countries, Czech Republic, Hungary, Poland, Slovak Republic), with particular focus on agricultural advisory

services. The characteristic includes AKIS description, history of advisory services, public policy, funding schemes, human resources, clients and topics, performing and planning of advisory work and section on how the Farm Advisory Systems (FAS) was implemented.

Average UAA per holding in the V-4 differs significantly. It is connected to different historical development in V-4 countries relating ownership of agricultural land. The highest is in Czech Republic 152, 38 hectares per farm, in Slovakia 77, 49 hectares per farm. In Poland, it is 9, 6 hectares per farm and in Hungary 8, 1 hectare per farm.

There are important differences in living standards expressed by GDP per capita among V-4 countries. Czech Republic reports 57 percent of EU-27 average value, Slovakia is at 52 percent, but Poland and Hungary are slightly above of 38 percent.

There is prevailing type of public (fully and semi-public) advisory organizations in V-4 countries. Mixed system (public-private) of financing is main source of funding of agricultural services within V-4 countries.

It is impossible to standardize and unify the same structure and one identical frame of agricultural knowledge and information system within V-4 countries. Diversity of AKIS system is influenced mainly by historical and economic development of concerned country, legislation, financial support, needs and expectations of the all involved stakeholders.

Czech Republic: There is strong relationship and rather formal cooperation between actors at particular level, formal and informal cooperation between levels and personal linkages and networking are additional benefits of AKIS system.

Hungary: Cooperation within AKIS system is characterized by weak relationship among the actors and must be improved in terms of knowledge flows.

Poland: There is different quality level of relationship between AKIS actors. Very strong cooperation is between farmers and advisory organisations. Strong cooperation is between farmers and suppliers of inputs, farmers and sales, advisory actors and research and education actors, advisory actors and agricultural policy makers.

Slovakia: Despite the integration of organisations in relation to research and advisory, as well as links among the farmer's community, were not successfully developed after EU accession. From this point of view AKIS system does not function well where cooperation is not enhanced from policy maker actors. The specific national agreement about integration of knowledge exchange does not exist among AKIS actors.

In V-4, there is undergoing process of decentralization and fragmentation of advisory services along with progressive commercialisation and privatisation of public organisations. Globalisation results in an increase of competitiveness between suppliers of advisory services and increasing influence of new providers of advisory services such as NGO's and FBO's. The major objective of extension system is to combine the expert skill of agricultural holdings and state of the art usable scientific knowledge from research and education field to support local agricultural economies. Policy makers have to motivate AKIS stakeholders to enhance linkages, to eliminate gaps in communication and bridge blank spaces among separate elements of extension system aiming to improve cooperation and strengthen business relationship.

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Social activity of rural communities in Hungary - Experiences of research camps

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Abstract
In this paper two basic points of the successful operation of a settlement will be examined. On the one hand, social activity will be studied. Since, according to the authors, a cooperative, active local community is essential for sustainable rural development in rural areas. On the other hand, in authors' opinion a settlement can be successful in the long run only if its own a positive internal image. To achieve this, the settlement management needs to know how can work the local communities, how the locals perceive their own settlement, what do they regard as their strengths, weaknesses, dangers, opportunities.
Therefore, this study gives a comprehensive overview about the social activity and the internal image of two Hungarian rural communities which are in quite different socio-economic situation. The findings of this study are based on interviews made with the leaders of social organizations and other key actors of rural communities and questionnaire surveys conducted among inhabitants within research camps in the summer of 2014 and 2015 in Hollókő and Átány villages.

Keywords: *social activity, civil social organizations, internal image, sustainable development, rural community*

JEL Classification: *Q01, Y90*

1. Introduction

It is generally believed that successful settlements can come into being where the citizens are also prosperous and successful; thus where the growth, the improvement of the quality of life appears also in the life of the community and of the individual. In this case the citizens are obviously content; they can create the properly multilateral and complex expression of interest (Bódi & Bőhm, 2000). However, this scenario cannot be considered as a standard. Interpreting the success of settlements as the set of individual successes is a bit simplifying and idealistic. The individual successes do not always provide clear communal values. There is not in every case a long-term sustainable development behind such a success.

Success cannot be reduced to one sole factor. Although in the first place the public opinion interprets the success of the settlements from an economical viewpoint, in fact the success of a settlement is depending on several economical-social factors. The field-research done in domestic settlements also proves this. The factors determining success are thus complex. Every factor that influences the local condition of existence and the quality of life has an effect on the development of the settlement, thus also on its success (Ludescher, 2010). Behind the successful settlements stands a stable economy and community. According to Bartik (1995) and Čapkova (2005) the emphasis is on the positive quality of life besides having a sustainable development.

The settlements and the surrounding social, economic sphere are constantly changing. Among the continuously changing conditions those settlements can be truly successful which are able to adapt to their environment. Adapting to the environment can be interpreted in a political, economic, social, technological, nature-geographical and legal sense. The settlements as

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autonomies due to their far-reaching role-system possess means of different characteristics, which can strengthen or even weaken each other's effects. One part of the instruments used by the settlements are unique (e.g. local taxes, local communities, etc.), whereas other instruments (e.g. administrative legal regulation) work alike everywhere. The success of a settlement depends also on finding their effective means and how well they use it.

The success of the settlement depends on the local economy and other factors, for example useful local conditions, local initiatives, a genuine management of the settlement, a positive internal image and anactive local community. Social activity of local actors has a range of benefits, for instance better decision making and enhanced cost effectiveness (Atkinson, 1999). Civil social organizations can contribute significantly to the development of local community, building of social capital and so to the strengthening of trust and cooperation among them (see e.g. Kuti, 1996; Nárai, 2008, 2004; Putnam, 2000; Reisinger, 2012; Szakál, 2004 etc.) One of the main functions of such organizations is that they can activate the community members, and so can foster their integration into the local society (Kuti, 1996). Besides, civil social organizations have a great importance from economic (e.g. contribution to GDP, employment, etc.) and development policy point of view and promote the appropriate operation of democracy (Reisinger, 2012). Thus, civil social organizations can provide a better quality of life for community members.

Because of the above mentioned benefits, the number of civil social organizations in Hungary has significantly increased for the last two decades. They have already been present at many different (e.g. economic, social, health, charitable, cultural, sport and public security) areas of life (Pierog & Szabados, 2012).

Beside social activity, an own positive internal image is also vital to the successful operation of settlement in a long run. This means people living in the given region have a positive image from their own settlement. Nevertheless, a positive image can be built from a miscellaneous and controversial image. This needs adequate community building, well-defined goals; such ones as everyone can undertake, with which everyone can identify themselves. The head of the settlement has to be fully aware of the fact how the locals see their own settlement, what they regard as their strength, their weaknesses, dangers, opportunities (Molnár, 2015). In this paper we summarize our experiences about internal image. The starting point is that the local social activity is reflected in the interior image.

2. Data and Methods

Two Hungarian settlements were involved in this examination: Átány (Heves county), and Hollókő (Nógrád county). Átány is village in a less favoured area from social and economic point of view with a population of 1487 people (in 2013), while Hollókő is a frequented touristic place (the only UNESCO World Heritage village in Hungary) with a population of 333 people (in 2013) (Figure 1).

This paper provides an overview about the internal image and social activity of the population of the two examined villages. Among others the main activities, the difficulties and some other important characteristics of civil social organizations will be presented. In addition, the opinion of the inhabitants of rural villages regarding the necessity and the visibility of these organizations has been mapped as well.

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Figure 1: The location of Hollókő and Átány villages

Source: Google maps, 2016

To obtain the necessary data for this study, first an overall document analysis was done. Then research camps were organized in the examined villages leaded by the authors in the summer of 2014 and 2015. In the frame of field research, interviews were made with the leaders of social organizations and other key actors of rural communities. Moreover, questionnaire surveys were conducted, too. The sampling principle of the questionnaire survey was to collect information about every third households. Some of findings related to internal image and social activity of local people are presented in the next chapter.

3. Results and Discussion

3.1. Internal image in the examined villages

It is established that the internal image is not unambiguously positive in Átány. The population of the village was surveyed by following question: '*Your village is nice, and it has got good atmosphere.*' The answers had to be indicated on a Linkert scale that showed to which extent the respondents agreed with the above mentioned statement. It can be seen on Figure 2 that most of the people partly agreed with it. On the other hand, a large amount of people did not agree with this statement, so in their mind the village is not definitely nice and doesn't have a good atmosphere. In addition, many people did not give their opinion. In our opinion, this is not a really positive special value judgment as well (Figure 2). So, altogether around 40% of the respondents had a negative internal image according to the outcomes of the questionnaire survey.

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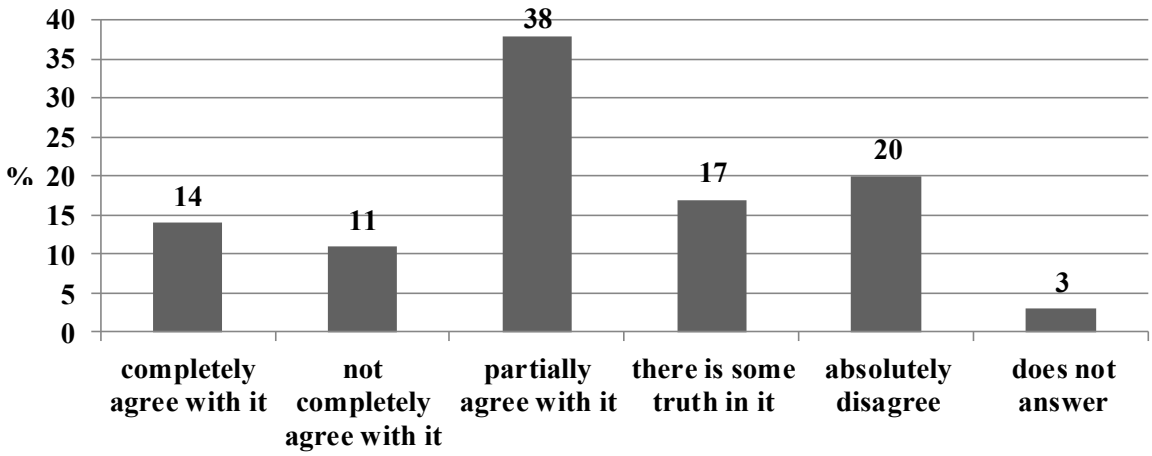
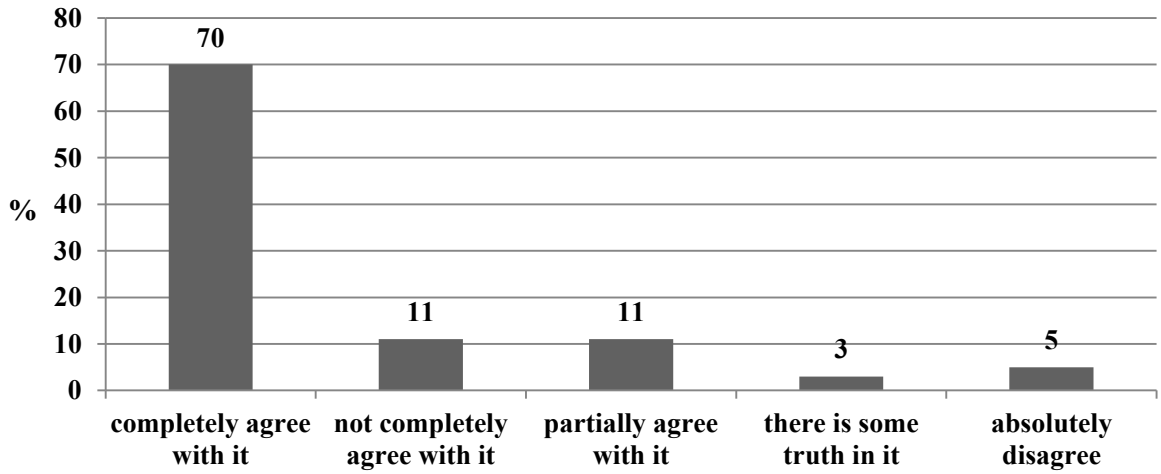
Figure 2: Internal image in Átány village – Distribution of answers for the question '*Your village is nice, and it has got good atmosphere.*' (%)



Source: own questionnaire survey, 2014

It was found that the internal image was much more homogeneous in case of Hollókő. In the mind of the inhabitants the village is firmly nice and it has got good atmosphere. So the village has got positive internal image (Figure 3).

Figure 3: Internal image in Hollókő village – Distribution of answers for the question '*Your village is nice, and it has got good atmosphere.*' (%)



Source: own questionnaire survey, 2015

3.2. Social activity in the examined villages

We surveyed what the villagers think about the necessity of communal organizations in their own village. Most of the respondents considered the existence of such organizations important in both settlements. While in Átány more than two-third (69%), in Hollókő more than four out of five citizens stated that there is a significant need for such community organizations.

Although in both villages the majority thought the existence of these organizations vital, less than one-fourth of the respondents were members in at least one local civil society organization. The ratio of those who stated that they did not participate in the membership of any organizations was higher in Hollókő than in Átány village. While in Átány more than two-third of the villagers were not members in any local civil society organizations (68%), in Hollókő it was almost three quarters (Figure 4). However, we assume that the respondents, who stated that they did not know whether they were members in any NGOs, probably did

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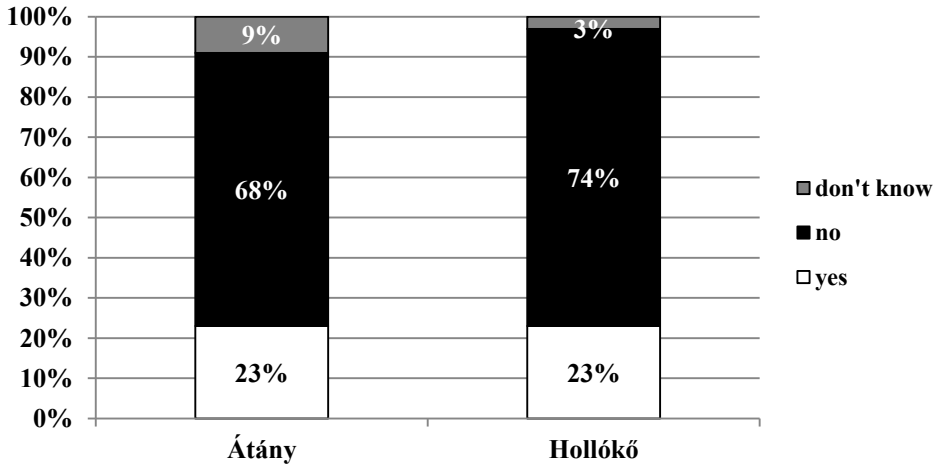
also not participate in the memberships. If it is true, then the proportion of members was equal in the examined villages.

Figure 4: Memberships in local civil society organizations in Átány and Hollókő villages (%)



Source: own questionnaire survey, 2014-2015

The reasons for non-participation in civil society organizations were partly similar. Many people noted they had no time for participation because of the family or job; or their health state did not allow them to join to any civil society organization. However, some differences were revealed between the villages as well. In Hollókő most of the respondents decided on non-participation in NGOs on their own. They did not have a need for being active in social term. In Átány the majority had different reasons for the lack of active participation. Most of the villagers had afraid to let their home empty because of the bad public security (e.g. very large number of burglary and theft). Therefore, they were not able to active participate in community organizations.

In both settlements ten civil society organizations operated during our fieldwork. In Átány their activities were a bit more diverse than in Hollókő. In both villages most of the NGOs aimed at preservation of culture. Their proportion was 40% in Átány and 60% in Hollókő (Table 1).

Table1: Main activities of civil society organizations in Átány and Hollókő villages (%)

Area of activity	Átány	Hollókő
culture	40	60
education	10	0
militia	10	10
social	20	0
sport	10	10
tourism	0	10
other	10	10
total	**100**	**100**

Source: interviews, 2014-2015

In both villages could be found sport and militia organizations, too. Because of the disadvantageous socio-economic situation two social organizations and an educational one operated in Átány. In Hollókő there was no need for such organizations. But since Hollókő is frequented touristic place, a touristic organization also operated there (Table 1).

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Some of the civil social organizations worked not really actively in both villages during our field research, but they did it for different reasons. While in Hollókő the main reason was ageing of population, in Átány primarily the lack of financial opportunities causes operational problems.

The general visibility related to these community organizations was also studied. It was found that the awareness was quite low in both cases. More than half of the inhabitants could not mention any local civil society organizations at all. In Átány NGOs being responsible for the improvement of the quality of life of retired people, preservation of cultural heritage were the most well-known organizations. In Hollókő the home guard NGO was on the first place, than cultural organizations came. Moreover, civil society organization aimed at development of tourism was also well-known.

The number of members in civil society organization was also studied in both villages. It was found that the average number of members was smaller in Hollókő than in Átány, which probably correlated to the population number of the examined villages. In Hollókő the membership consisted usually of 5 to 30 people. In Átány the picture was more diverse. The number of members was higher than 60 in 40% of the organizations. On the other hand, in other organizations less than 10 people took part in.

4. Conclusion

First, the internal images of the two examined villages were studied in the paper. It can be concluded that while in Hollókő it is absolutely positive; in Átány the situation is not so clear. Since a large amount of people did not agree with the statement of '*Your village is nice, and it has got good atmosphere.*' in the questionnaire survey conducted in the summer of 2014. This result reinforced our assumption that the internal image is not unambiguously positive in Átány. In our opinion, these findings are connected to the social activity of the population in the examined villages. It can be established that only a limited number of people have been socially active in both villages, but if we take the size of population into account, the situation have been better in Hollókő. Although the population in Hollókő is only around one-fourth compared to the population in Átány, the same number of civil social organizations has operated in both settlements.

However, according to the subjects for interviews the social capital and the willingness to cooperate used to be much stronger in the past in both cases. In Hollókő because of ageing of population the community has become quite passive. Although we found some good examples for cooperation in Hollókő, young people have cooperated only during the implementation of touristic programs and even then mainly for some selfish business reasons.

According the outcomes of the survey, the population in Átány has become indifferent and apathetic partly due to their serious socio-economic problems. The lack of solidarity and sense of belonging to the community were also often noted. Around 40-50 family have been really socially active. They have comprised the active membership of civil social organizations.

As a consequence of large number of civil social organizations operated in Átány and Hollókő villages, there have been significant overlaps of membership of such organizations. The overlaps have caused serious problems from time to time, because there have not been enough people to implement each action. In Hollókő the on-going replacement of members have risen the biggest problems because of ageing of population, too.

It is also concluded that the main activities of civil social organizations refer to the socio-economic situation of the examined villages. While more organizations aim at the improvement of social situation of inhabitants in Átány, in Hollókő cannot be found such NGOs. But in Hollókő a touristic association runs due to being a frequented touristic place. However, the most popular organizations are targeted at preservation of culture in both villages. It can be stated that the activities of organizations were slightly more homogenous in Hollókő than in Átány. This can also be noted in terms of compositions of membership and financial opportunities.

As it is mentioned above, although the majority of respondents indicated a significant necessity for community organizations in our survey, their general visibility have been quite law in both settlements. The awareness of population concerning existing civil social organizations should be raised in the future. Moreover, in our opinion, a greater emphasis should be put on the development of willingness to cooperate. Although we have seen some good examples for cooperation between local civil social organizations, continuous cooperation is not typical. Cooperation opportunities should be much more exploited in the future in both villages.

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The role of tourism types in the context of rural development in Hungary

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Abstract
Various expressions are used in the international literature for tourism in rural areas, which mainly reflect what activities they focus on while realizing tourism. By national and international researchers and authorities, rural tourism is usually interpreted as a part of rural, agricultural, regional, environmental and tourism development as well, highlighting the interaction between these fields. The aim of our study is to have an overview on the role of tourism in the rural development, by collecting the various approaches. In our paper, we also focus on the situation of Hungary, since many rural areas consider tourism as a way to catch up, even if they do not have the necessary economic and social conditions and resources. Tourism is thought as the easiest development possibility for areas lagging behind, but it is a misleading concept. We believe that in many cases tourism can be an appropriate tool to revitalize rural areas, to keep and create rural jobs and to maintain services, but without an overall and long-term concept it is not possible to achieve sustainable development in the sector.

Keywords: *agro-tourism, rural tourism, eco-tourism, complex packages, rural development*

JEL Classification: *R58, Z30, Z32*

1. Introduction

According to Swarbrooke (1996), rural tourism is one of the main priorities of tourism development in a lot of European countries. The demand for relaxing in rural areas is growing, while many rural areas face challenges and their future is unstable either due to the changes in the agricultural structure, or the more attracting urban life. At the same time, the expressions of rural-, agri- or agro-, farm-, and ecotourism are all common, which means that it is not a clearly defined touristic product/service, however, most of us know and understand the essence of it and know what to expect if involved in rural tourism. Such expressions are usually considered the same, however, they cover different sectors and activities in different countries, even in Europe, because tourism activities are based on the local agricultural structure, traditions and cultural relations. In the chapter the various expressions, approaches are summarized in relation with rural tourism.

1.1 Major types of tourism related to the countryside

The supply of **agrotourism** is quite specialized, it has concrete profile. In this case, agriculture-related endowments are selected from the local conditions and are formed into tourism supply. Agrotourism includes tourism located in agriculture-dominated regions aiming at the sales of agricultural products. Agrotourism represents a concrete product type in rural tourism, where a small-scale agricultural company provides the frame for the receiving tourists. Most of the attractions are from agricultural activity and products which are usually served to the guests. Accommodation is a related supply to agricultural products, but it is not the most important element in agrotourism product supply. The supply is specialized for the selected target groups. It covers sport- and hobby-tourism related to agriculture like horse-riding, fishing, hunting and wine-tourism. It is about joining the agricultural activity, e.g. harvesting, drying fruits, making honey on a conventional or even on an organic farm.

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Consuming and trading with the agricultural products (wine, cheese, vegetables, fruits, smoked processed meat products) on site as well as active participation in the processing of agricultural products are popular attractions. The advantage of agrotourism is that it supports the direct sale of local products, thus helping the marketability of agricultural products.

Ecotourism is also strongly related to rural tourism. According to the Québec Declaration (19-22 May 2002), the major features of ecotourism are as follows:

- It covers all the tourism types which are based on nature and the main motivation of tourists is nature. In addition, learning about the local culture is becoming increasingly popular.
- Tourists have strong learning motivations and environmental nurturing.
- It is usually organized in small groups, local enterprises may take part in the organization. It is not a mass-tourism and is conducted by a guide.
- Main attempt is to avoid or minimize unfavourable impact on natural, social and cultural environment.
- Especially important aspect is to allow the local community to take part in the organization and management of tourism.

The defined principles and criteria reflect that ecotourism meet the gentle tourism requirements and have strong link with sustainable tourism. Thus it may offer alternative touristic types to mass-tourism.

As the range of the tourist is expanding in the rural areas, the special characteristics of rural areas are more and more emphasized. Such intensive attraction might be a famous traditional product of the given area, e.g. wine, cheese, tobacco. To learn about such agricultural products, **thematic routes** may be created. Thematic routes offer the whole range of rural experience (making and consuming traditional products as well as the related celebrations) including the built memories of the past. One of the engines of rural tourism is the wine, covering wine-routes, wine-related events, festivals, auctions etc. Based on the above-mentioned it can be seen that there are various forms of tourism which are related to the countryside, however, it is because of the values they represent but not because the necessary conditions and resources are all available for a successful, profitable and sustainable tourism in the rural areas. Moreover, the venues of rural tourism are often disadvantaged rural areas or ones lagging behind, which are valuable areas from environmental point of view but usually do not have the necessary economic and social background.

Agriculture has always had significant role and important functions in the life of rural areas as well as in rural development. However, the ability of agriculture to keep the population in the countryside has dropped sharply, which is reflected by the number of people employed in the agriculture as well as in the decrease in the agricultural incomes. Thus it is necessary to find supplementary income sources for agricultural employees that can be through organic farming, herb production, hungaricums, animal husbandry, handcrafting or tourism. It can be stated that rural tourism cannot be the main source of income, it may only be an additional activity, since it contributes to the diversification of the farmers. In that way, it takes important role in meeting the ecological-environmental targets of rural development, i.e. creating sustainable agriculture, agro-environmental protection, and the preservation of natural and built environment. As rural tourism provides supplementary income to farmers, it contributes to strengthening the rural values, especially in those areas where intensive farming is not feasible due to the natural endowments.

So tourism should be able to function together with agriculture, thus can be efficient tool of complex rural development. However, in many cases the lack of cooperation in the region as well as the lack of regional approach are obstacles of the development. Many of those living

in the countryside do not know or underestimate the local resources, possibilities, attractions which are usually famous nationwide. It is a very important, successful determining value of a settlement, to have a "seed" which unites and moves the community and if people representing various interests, values can connect to this. An ***active local community seed*** is thus needed. The community's internal structure, dynamics is a value, which can turn into a strategic resource when helping in mobilizing the local economic and social resources. Activities of a narrow core group cannot result in a lasting success if there is no adequate support from the wider community (Nagyné, 2013). According to Kassai and Ritter (2011), much more emphasis should be put on joint actions and encouraging cooperations within and across the regions, since such cooperations could strengthen the local activity and contribute to a more efficient use of local resources. Rural tourism has real potential in such areas where in addition to the attractive natural resources, the local businessmen recognize the importance of cooperation and cooperate in offering complex packages to tourists. It should be highlighted how tourism in rural areas can often bring about unintended conflict and the importance of dialogue and co-operation among actor groups to bring about mutually beneficial outcomes (Vaugeois, 2015). For the hosts, tourism provides extra income (Bainé Szabó, 2003), however, it is stated that rural tourism in Hungary is not really linked to agriculture and services apart from accommodation (catering, programs) are rarely offered. The average length of stay is short, the supply is limited and the rate of use of facilities is poor. The human resource in rural tourism is not sufficient, since most of the hosts do not speak foreign languages. The role of qualified human resource is inevitable (Bainé Szabó, Könyves, and Tikász, 2006). Considering the Western-European samples, our handicap in human and technical facilities is huge.

1.2 Various interpretations of rural tourism

Rural tourism is interpreted in various ways by authors in different countries. For example in Italy, it covers all activities related to the countryside either it is a weekend spent in a hotel for 100 people or walking on a wine route. In the Netherlands, village tourism is rather a holiday in a camping next to a farm, in which the most popular activities are going on excursions, cycling and horse-riding (Turner, 1993). In Greece, e.g. the major service provided in rural tourism is „bed and breakfast", i.e. accommodation in traditionally furnished rooms and breakfast made from home-made traditional products. Additional services might be offered by restaurants; other cultural and recreational programs may also be available. In Finland, village tourism is rather the rent of a holiday home, usually without catering (Rátz & Puczkó, 1998). In Hungary, there is no generally accepted definition for village tourism. It covers activities from the simple village accommodation to a complex product with multiple elements.

The definition by EURTER French Institute is broadly accepted and applied: rural tourism is defined by the valorisation through tourism of agrarian spaces, natural resources, cultural heritage, rural housing, local popular traditions and products through specially labelled products that reflect the regional identities and cover the needs of the consumer for accommodation, gastronomy, leisure activities, animation, and other services, with the objective of a local sustainable development and an adequate answer to the needs of leisure of the modern society within a new social solidarity between city and countryside.

1.3 Rural/village tourism, as a complex supply

From the host's point of view, village tourism is advantage because:

- it creates jobs, thus reducing the number of migrants or commuting;
- it can function as a supplementary activity to agriculture, so it can contribute to diversified profile;

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- it can be a secondary income source which comes from serving own, home-made products to the visitors, renting rooms for tourists as well as providing additional services;
- it may encourage infrastructural development;
- it may expand the range of leisure-time and cultural activities in the village;
- it may have impact on the change in lifestyle, thus bring the urban and rural lifestyles closer to each other.

From the tourists' point of view, the following advantages can be listed:

- village tourism offers holiday which is cheap and close to nature;
- it enables the tourists to know the landscape and people in their own environment;
- it is an active free-time activity, which means that guests may take part actively in the work of village people (harvest, feeding animals, pig slaughter);
- it contributes to learning new skills, rural traditions (old, traditional handcrafting, real local flavors);
- it helps the domestic tourists to learn their own country;
- it helps the foreign tourists to get to know more about our country.

Some statements about village tourism:

- Village tourism – in most cases – is created artificially because of must, which aims to generate supplementary income (Antal, 1994).
- It is based on local resources. It can utilize natural values, local agricultural products, empty houses, unused resources, knowledge of elderly people as well as unexploited human resource (Kovács, 1995). Village tourism may benefit from such things which have no or low cost, like intellectual capital, natural treasures, traditions, local famous places and if they are not used, the population becomes poorer not only economically but culturally as well.
- It is really a complex product.
- If there is one family in a village who receives tourists, it is not rural tourism yet. It is about creating a community (Kovács, 1993). It is usually based on family businesses, but the cooperation in the region is inevitable (Faludi, 1994).
- Village tourism is close to nature and exempt from urbanization, offering recreation without noisy and stressful cities. However, the demand for convenience is a high.
- It provides personalized services. One feature that makes rural tourism unique is that there is a personal relationship between the host and the guest (Danis, 1995). That "personal" feature exists with the broader environment and the host population as well.

The supply of village tourism is really complex. It is much more than providing accommodation with some programs. The village atmosphere, the personal relationship with the hosts and the local people, the wide range of programs and services are all parts of rural tourism, as well as the price, accessibility, weather etc. (Sharpley & Sharpley, 1997). Clean environment, neat gardens, high quality restaurants as well as convenience should be basic elements of supply because urban population, even if shifting from cities to villages, need and insist on basic services like pharmacy, doctor, shops of high quality. So rural tourism – as a touristic product – contains both hard and soft elements. The key factor of rural tourism is not the village, but complex services related to historical, traditional, cultural, environmental, sport, leisure-time activities under rural circumstances. Based on the abovementioned, rural tourism with its wide range of supply both uses and preserves, takes care of the natural beauties, gastronomy, traditions and intellectual heritage of the countryside.

Even if there are various concepts and definitions for tourism carried out in the rural areas, we consider the "rural" expression the most appropriate, since such tourism is related to several

other sectors and activities, and at the end it can contribute to a complex development of the countryside, so it may result in rural development.

In the next part of the chapter we summarized the most important policies and concepts of tourism development in Hungary so that we could see how much the policy-makers take tourism and rural tourism into consideration in the future development of the country. Due to its favourable geopolitical features and natural endowments, tourism industry has always been a key sector in Hungary. It is well-known even on the international market and visited by increasing number of foreign tourists. At the same time, we should see that tourism is concentrated in a few specific locations (Budapest, Lake Balaton, Lake Velence, thermal bath cities etc.) and it does not really contribute to the development of rural areas lagging behind (Kollár, Tóth, and Péli, 2012). So tourism should not be targeted as an individual sector, but it should be integrated into spatial development policies to achieve positive results all over the country.

1.4 Recent policies and strategies on the development of tourism in Hungary

The New Széchenyi Plan entered into force in January 2011, which had 7 key priorities, including the **Healing Hungary – Health-industry program**, with special focus on health tourism. The rest of the key programs (green economy, housing, enterprise development, science-innovation, employment, transportation) also had touristic linkages (Kardos, 2011). They all integrated various industries and sectors, leading to competitive products and services even in middle-terms. The Program, on one hand, aimed at a more efficient use of thermal water reserves and geothermal conditions, on the other hand, harmonized system of industries which preserve health and promote health-conscious lifestyle. A focal point of the Program was a complex use of thermal water supply and to create a uniform structure of the related products and services. Consequently, it had several links to other sectors of the economy. The Program did not aim at the financing and restructuring of the Hungarian healthcare system, but it intended to use the worldwide unique thermal water supply in a complex and sustainable way, creating synergies among the sectors.

Major objectives of the Program:

- **Catching-up of areas lagging behind:** Complex economic and social development programs for underdeveloped areas where there are only a few cities and usually near the borders of the country.
- **Complex use of geothermal energy:** It includes the energetic use of high and low temperature thermal water before and after healing, economical and sustainable energy use, the reduction of energy-dependence as well as the self-sufficient energy supply.
- **Protection of natural endowments, maintaining their quality:** Health tourism can be based on the favourable natural conditions, and human resource. To provide the basic requirements of long-term international competitiveness, special focus should be put on the protection of the water-basis, regular control and quality assurance of healing pools, the promotion of water use and reuse, introduction of modern technologies as well as the revise on quality brands.
- **Long-lasting increase in the country's competitiveness:** Most of the sectors in the health industry contribute to the supply of products and services. Such a „national industry" may be created that may provide strategic advantage and specific to our country. It creates numerous jobs, makes a lot of income, thus increases the national gross output.
- **Knowledge-development:** In order to improve the quality of health industry and health tourism, the expansion and development of professional knowledge are inevitable. Experts with information about international trends are expected to bring

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the need for introduction of new technologies (http://kultura.kreativeuropa.hu/letolt/uj_magyarorszag_fejlesztesi_terv_0801.pdf).

Two major parts of the program: one is about health industry-based tourism, the other is about thermal health industry**.** The key priority of the first one is to create the framework and the institutional system for health touristic products and services, aiming at the maintenance of the health of both the body and the soul. The second aim is to discover all the possible ways of using the thermal-, healing- and mineral water, as well as the relations to other sectors. It aims to find out what innovation can be carried out based on health industry and to define the "background" sectors that serve the development of the industry (Kardos, 2011).

According to the **National Tourism Development Concept (2014-2024)**, Hungary is expected to be the most popular destination of Europe in health tourism by 2024. In order to get the supply to the market, efficient, well-organized and strategically managed system of incentives is necessary, including the country-brand and the national marketing activity.

Tools to achieve the desired aims:

- innovative and creative high quality products and supply;
- creation of an environment that improves the competitiveness of the tourism in Hungary, job creation;
- restructuring of the institution system of tourism based on the TDM system;
- opening to international markets, to the Eastern countries by international marketing and by using incentives.

The Concept also includes product-specific priorities as follows:

- **health tourism** – touristic products based on the complex development of bath destinations providing medical services;
- **heritage and cultural tourism** – major national and cultural heritage promoted as touristic attractions by establishing thematic routes and visitors' centers;
- **MICE-conference tourism** – establishment of one large congress center and the conscious expansion of further conference facilities, strengthening the professional tourism character of Hungary;
- **religion tourism** – complex development of pilgrimage routes and touristic networks which can be known even Europe-wide;
- **festivals, event** – marketing of national or regional events onto the international market;
- **development of national gastronomic networks and important festivals**, matching the region-specific traditions, cultural and historical conditions;
- **ecotourism** – complex development of ecotouristic destinations, creation of visitors' center in national parks, organizing events and exhibitions;
- **bicycle tourisms** – complex development of bicycle routes by exploiting the territorial differences;
- **water tourism** – establishment of port networks meeting the international standards, development of water tour bases, harmonizing them with bicycle tourism;
- **equestrian tourism** – complex development of equestrian touristic centers, increasing the interest of domestic tourists in equestrian tourism, creation of routes that can be interesting for foreign tourists as well;
- **village- and agrotourism** – development of village and rural touristic attractions and services by diversifying the supply based on local values, cultures and traditions (*National Tourism Development Concept, 2014–2024*).

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Expected results due to the realization of the objectives by 2024:

- the GDP contribution is expected to increase to 10%;
- the number of registered employees in tourism sectors is expected to increase by 50%;
- Hungary is expected to be among the top 30 in the world, regarding competitiveness;
- statistics on domestic tourism is expected to increase by 30%;
- the number of foreign visitor nights and average spending are expected to increase by 50%;
- penetrating new markets in harmony with the Eastern opening strategy (*National Tourism Development Concept, 2014–2024*).

Based on the strategies and concepts detailed above we can see that tourism in general is supported in Hungary, tourism is expected to contribute to the national GDP to larger extent and provide more jobs. Due to the favourable natural conditions and thermal water resource, most of Hungary is thought to be suitable for tourism activity, but it is a misleading concept. The rich natural and historical resources and attractions are not enough to maintain sustainable tourism in the whole country. There are several micro-regions (especially in Northern-Hungary, Northern-and Southern Great Plain, Southern-Transdanubia) which are the least-developed micro-regions and require complex development programs to catch up and to moderate the territorial inequalities within the country (which is the major aim of cohesion policy).

2. Data and Methods

In order to achieve the aims of our research, we have done detailed literature review about the European and Hungarian literature related to rural tourism. We collected various definitions and expressions that are used to reflect tourism activities carried out in the countryside to show how different they are considering the country-specific conditions. In addition, we made it clear what approach we represent. We collected data about the number of nights spent by tourists in accommodations in villages of Hungary for the last 15 years. The information source was the Central Statistical Office. The Office collects the relevant data only after 1998, so we covered the period from 1998 to 2013. We also wanted to see the proportion of foreign and Hungarian tourists in that relation. We wanted to find out if rural accommodations are preferred by domestic or foreign tourist. In our opinion, rural tourism is still a way for recreation for mainly Hungarian people with low incomes, which strongly restricts the development needs defined by the people dealing with rural tourism. We believe that rural tourism should be built on a professional basis and requires various economic, social and environmental conditions.

3. Results and Discussion

In order to see whether there is real improvement in rural tourism and whether it is a real potential for most of the villages, we have collected statistical data about the nights spent in accommodations in villages of Hungary. Regarding methodology, it has to be mentioned that the Central Statistical Office collects separate data for village accommodations since 1998, so it is the first year in our analysis. Figure 1 shows that despite of the various links of rural tourism with other sectors and despite of the favourable natural endowments of Hungary, the number of nights spent in village accommodations shows a gradually decreasing tendency after 2006. Due to the lack of local cooperation and the poor quality of services as well as the low qualification of people dealing with rural tourism, the figure dropped to 329,155 by 2013. Compare to the peak year (2003) value – 586,529, the decrease was 44% by 2013. The

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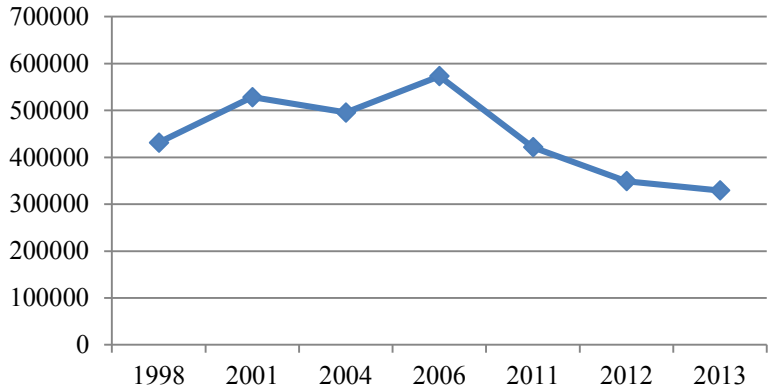
increase between 1998 and 2006 was due to the increase in the number of service/accommodation providers and not due to the increase per former existing units.

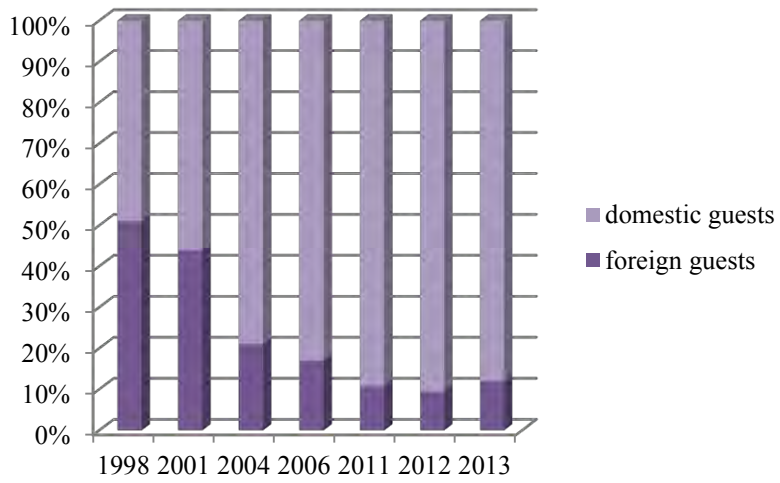
Figure 1: Number of nights spent at accommodations in villages



Source: Central Statistical Office, 2016.

Unfortunately, figures show that there is huge potential in rural tourism but it requires complex development measures.

Figure 2: The distribution of nights spent at accommodations in villages



Source: Central Statistical Office, 2016.

On Figure 2 it can be seen that village accommodations are preferred by domestic tourists, they are not popular among foreign visitors. It clearly shows that there are no festivals, programs, events, exhibitions which would attract foreign tourists to small, rural villages to stay overnight. The high rate (51%) for nights spent by foreign tourists in 1998 and 44% in 2001 can be explained by the lower total number of nights spent (431,272 in 1998) compared to the year of 2013. So the number of nights spent by foreigners was not higher earlier, but the share in the total changed only.

It is not only the total number of nights spent in village accommodations decreased over the years, but the territorial distribution is imbalanced as well. In Hungary, there are 9 touristic regions (which are not equal to the NUTS 2 spatial development regions applied in cohesion policy).

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Figure 3: The touristic regions of Hungary

Source: Raffay, 2007.

- Nyugat-Dunántúl (Western-Transdanubia)
- Közép-Dunántúl (Central-Transdanubia)
- Balaton (Lake Balaton)
- Dél-Dunántúl (Southern-Transdanubia)
- Budapest-Közép-Dunavidék (Budapest, the capital and Central Danube region)
- Észak-Magyarország (Northern Hungary)
- Észak-Alföld (Northern Great Plain)
- Tisza-tó (Lake Tisza)
- Dél-Alföld (Southern Great Plain)

As it is in cohesion policy, huge inequalities can be observed in the tourism sector as well among the regions. Such inequalities could be moderated by increasing the efficiency of tourism in the rural areas, generating more income for the local population, building on the rich rural values, but unfortunately tourism is concentrated in the capital and near the Lake Balaton, Lake Tisza and near the thermal resources. Looking at the Figure 4, we can see the regional distribution of nights spent in village accommodations. It is surprising that Lake Balaton is not included in the figure, which represents the most popular touristic destination of Hungary, but the Central Statistical office does not collect data about it in relation with village accommodations. We can see a clear picture about the significance of Northern Hungary, which had over 100,000 nights spent in the past few years. It is partly because in this regions there are not many hotels and partly because of the rich natural and cultural heritage of the region. Referring to the statement above, the village tourism in Hungary – despite of its potentials in catching up of the regions lagging behind – reflects decreasing tendency. Not to mention the significant territorial imbalances.

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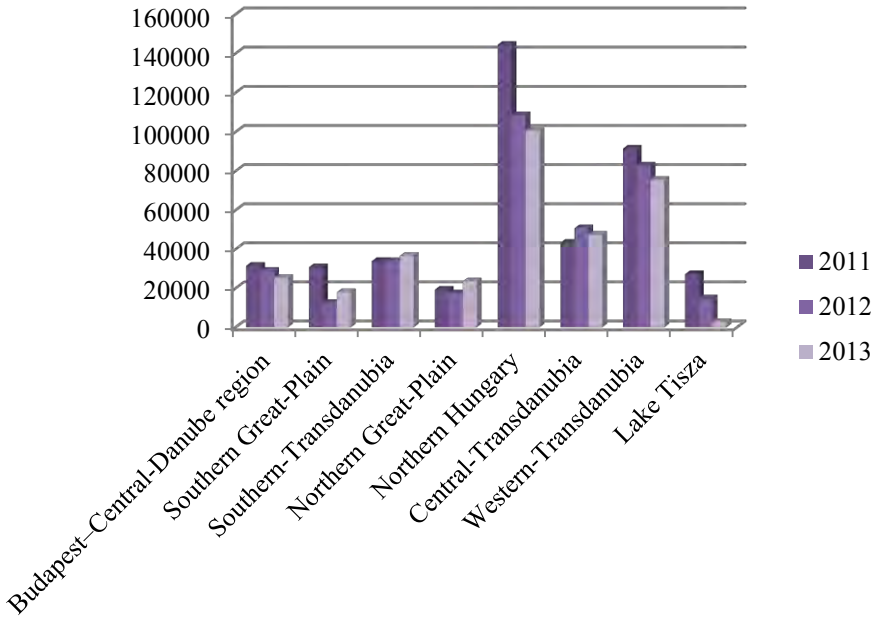
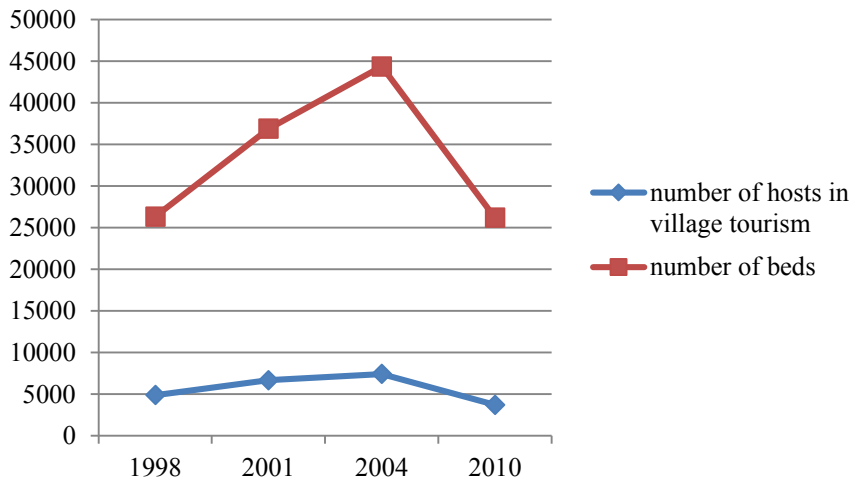
Figure 4: Number of nights spent in village accommodations by touristic regions of Hungary



Source: Central Statistical Office, 2016.

If we look at Figure 5, we can see that it is not only the demand which could be blamed for the decrease, but the supply. It can be seen that the number of those providing village accommodation dramatically dropped over the years as well as the number of beds. In 1998 there were 4,893 hosts, providing village accommodations, reaching the peak in 2004 (7,431), then dropping to 3,713 in 2010. At the same time, the number of beds started from 26,340 in 1998, reaching the peak in 2009 (49,862) and going back to 26,210 in 2010.

Figure 5: Supply in village tourism in Hungary



Source: Central Statistical Office, 2016.

The abovementioned tendencies are good basis for conscious and targeted tourism strategies because they prove that rural tourism has not brought the expected positive results and there are unexploited potentials and capacities. However, what we can see that there is a lack of integration, efficient information flow as well as cooperation between the service providers so that the potentials could be exploited more.

4. Conclusion

Based on the overview on the major recent tourism policies in Hungary, it is clear that tourism has always been present in the policies but somehow as a secondary priority. According to some experts and strategies, it is only one sector in the economy, while others say that it should be dealt with as an individual, gradually increasing activity in the economy. It is because Hungary has favourable conditions for various types of tourism. Still, it must not be forgotten that tourism requires high quality resources (not only regarding the natural endowments, but e.g. the human resource and the quality and availability of services). As it is seen from the strategies, tourism was always important, but not a strategic sector. Due to the last tourism development strategy (effect until 2024), tourism can find its real role in the economic and social development of the country, thus making it more competitive in the global market. Tourism has already had great impact on the development of regions, but we believe that it could have been greater if it had been elaborated in a harmonized and structured way. Each region has great potentials for tourism, however, it must not be the number one industry in regions lagging behind where there is a lack of necessary infrastructure. In such areas, the short-term strategies should focus on the basic infrastructure and business environment and only later on may come tourism. Regarding rural tourism, there are even more challenges, since in many regions it should be managed and organized with creativity, the people involved in rural tourism should be pro-active, since they are in less favourable market position compared to the most attractive capital or lakes and thermal resorts, however, they should survive on the same international touristic market.

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The role of trade marks in the field of rural tourism

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Abstract
As a result of the 2008 economic and financial crisis, a significant fall can be detected in the field of rural tourism. The Association of Tourism and Agrotoursim (FATOSZ) jointly with the Ministry of National Economy have decided to improve the quality of the tourism product. Their common goal is to attract the target groups that participate in rural tourism back to rural Hungary. They would like to enhance the quality of accommodations and aim to meet the needs of the "responsible rural tourist" as well. The "responsible rural tourist" aspires to have the least possible effect on the environment and culture of the visited region. The responsible visitor minimizes the damage caused by himself and with his awareness of consumption promotes the local people's welfare. The responsible tourist shows great interest in the agrotourism and getting to know the local folk culture.

Keywords: *rural tourism, agrotourism, trade marks*

JEL Classification: *R51, Q13,*

1. Introduction

The capacity and the number of hosts of rural accommodations have fallen by half since 2010 (Figure 1). The legal classification of accommodation establishments changed in the autumn of 2009, until the date private accommodations were categorized as other accommodations. From 2010 only those village hosts were transferred into the other category who provided rural accommodation services in settlements with a population less than 5000 thus the decline shown in the diagram of Figure 1 is not that unequivocal. We can assume that in 2010 a significant part of the hosts remained in the settlements with over 5000 people.

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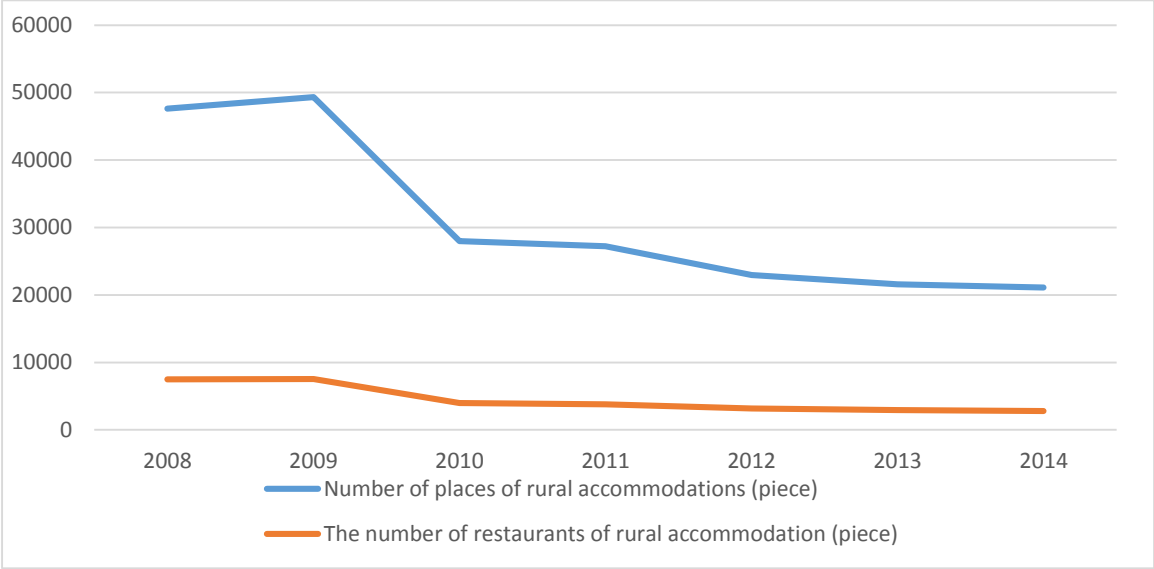
Figure 1: The number of places in rural accommodations and a number of restaurants in the rural accomodation (piece)

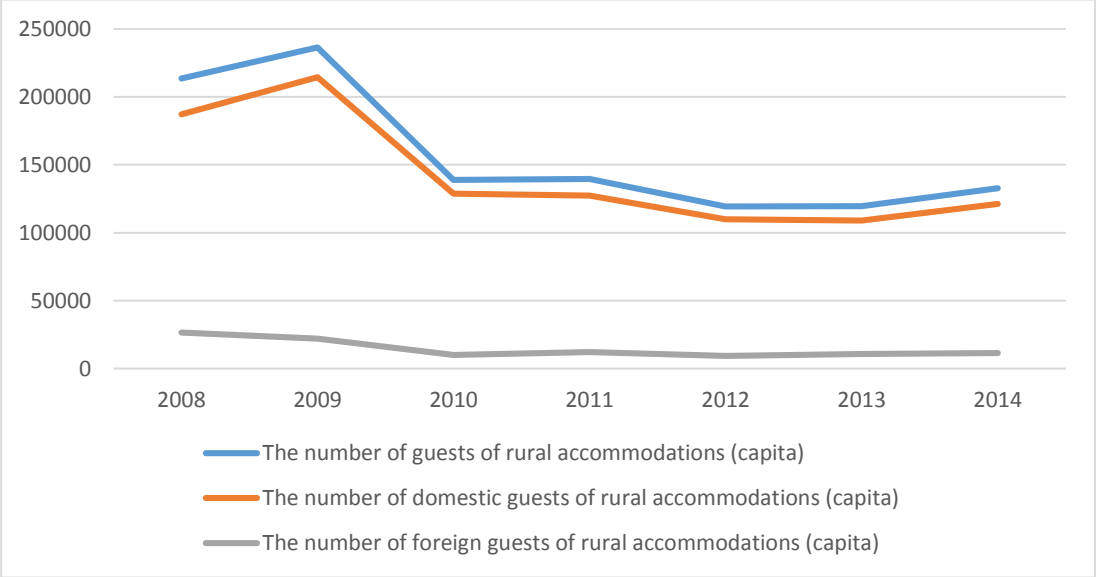


Source: edited by authors, Hungarian Statistical Office 2015

Families with children involved in domestic tourism give the largest target group of guests in rural accommodations and the economic and financial crisis that reached Hungary in 2009 reduced their discretionary incomes the most.

From 2014 the tourism industry has been growing rapidly in Hungary, if favourable price levels are maintained in rural lodging and quality services could also be offered, then the visitors who are believed to be lost would return as well.

Figure 2.: The guests of the rural accommodation (capita)



Source: edited by authors, Hungarian Statistical Office 2015

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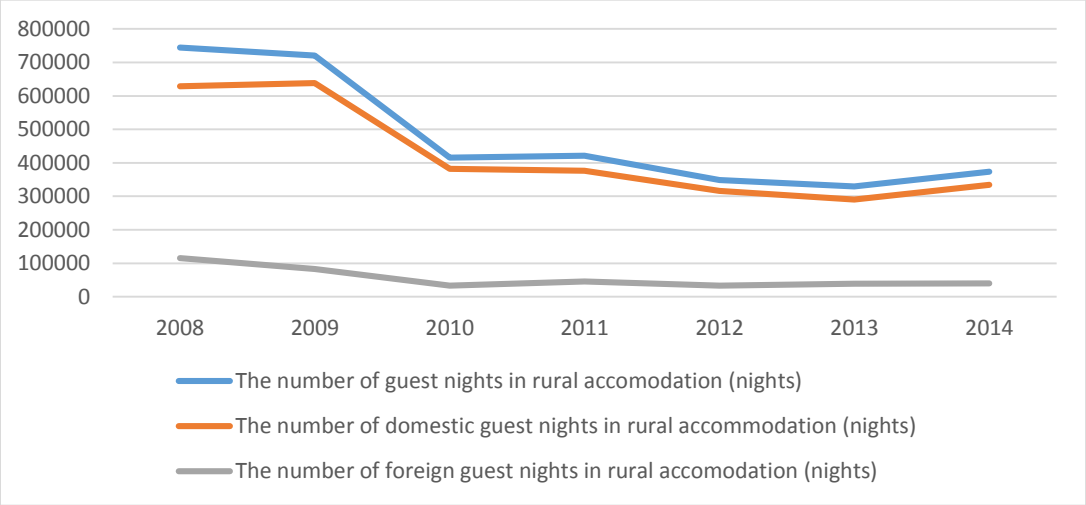
The change in the number of nights spent at rural accommodations was mainly influenced by the diminution of the average length of stay, in order to increase this number it would be crucial to modernise the accommodation establishments and improve their quality in accordance with the requirements of the era. The quality assurance trade mark program of FATOSZ appears to be a good initiative in order to achieve their goals.

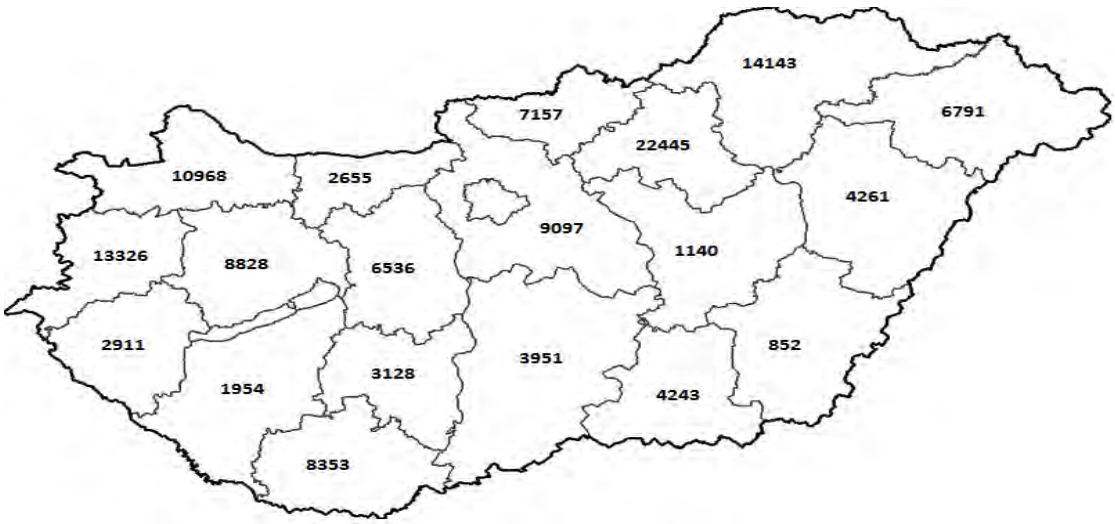
Figure 3.: The number of guest nights of rural accomodation (nights)



Source: edited by authors, Hungarian Statistical Office 2015

Looking at the numbers of guests at rural accommodation establishments in county distribution it can be said that the most visitors arrive to Heves and Borsod-Abaúj-Zemplén counties, however Vas and Győr-Moson-Sopron counties follow them closely, where the quality of the accommodation establishments has risen by leaps and bounds. In the field of rural tourism's renewal in addition to the accommodation trade mark it would be possible to evaluate the hospitality of the hosts as well.

Figure 4: The number of guests in rural places in 2014 (capita)



Source: edited by authors, Hungarian Statistical Office 2015

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2. Trademarks of accommodation

Most of the trademarks can be found in the area of lodging, the sunflower system introduced to the field of rural tourism stands out from the rest, by the end of 2015 1031 host registered in this system. This high number indicates that the steps taken towards the renewal of the lodging's quality were much needed.

At the rural accommodation establishments 1-4 sunflowers are used in conformity with several quality criteria, the external (building, courtyard) and internal (building, installation) spaces; the variety of services and their necessary staff requirements are classified separately.

The trade mark that certifies the rural accommodation establishments with a sunflower is created and operated by the ministry led by the minister of tourism, whose fundamental purpose in accordance with the 239/2009. (X. 20.) government decree that contains the detailed terms and conditions of the accommodation service activities and the order about the issuance of licenses for operation of accommodation, is to guarantee high-quality accommodation services that meet the professional expectations. The classification of services is executed on the basis of professional criteria that was developed by the Association of Rural Tourism and Agrotourism and was approved by the ministry led by the minister of tourism.

Figure 5: The National Trade Marks

Source: edited by authors, www.nfh.hu/nod/8622

Regarding the distribution of trade marks, Boros-Abaúj-Zemplén county leads, then Szabolcs-Szatmár-Bereg megye follows on the second place, while Heves and Baranya counties are on the third and fourth place. The ranking that has been rearranged compared to Figure 4 shows that in the smaller settlements of the counties that are afflicted with unemployment have big hopes for the new rating system.

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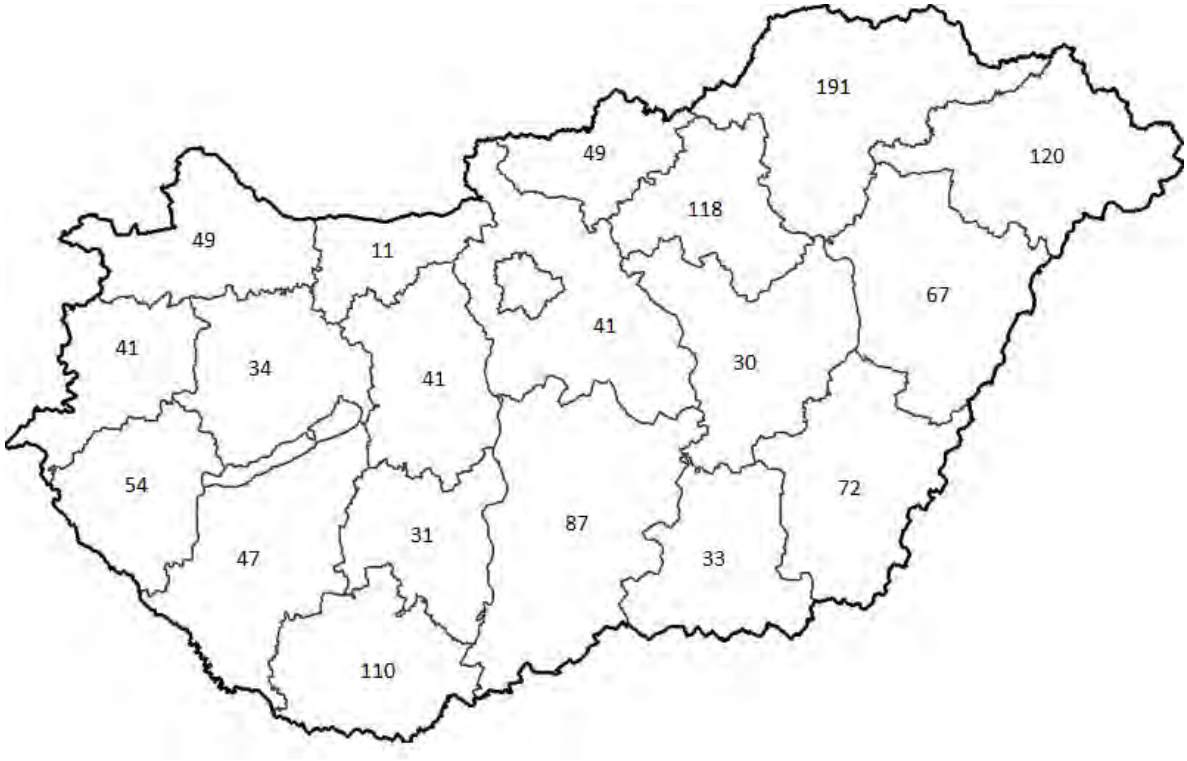
Figure 6: The distribution of marks counties



Source: edited by authors, Association of Rural Tourism and Agrotourism 2015

Each of the accommodation rating marks can affect the rural tourism, as a tourism product (Figure 7). However, it would be worthwhile to separately mark the eco-receptions that engage in organic farming with a green sunflower eco-label as well. The definition of eco-label refers to a certificate of a certain level of environmental performance that can be acquired voluntarily. Its attainment is based on objective criteria and any product, manufacturer or service provider that complies with the given conditions can obtain it. (Bodnár, L. 2005)

Eco-labels encourage the entrepreneurs to be more mindful during their activities of the requirements of environmental, social, cultural and economic sustainability, thus present a responsible attitude towards their environment. Eco-labels are capable of distinguishing those products and services that meet the environmental, social and economic standards on a higher level than as it is required by the legislation. This distinguishing mark allows consumers to consciously choose the certified product and the companies that manufacture and sell it can gain a competitive advantage (WTO 2004).

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Figure 7: Trademarks of accommodation

Source: edited by authors, www.nfh.hu/nod/8622

The trademarks rate the accommodation establishments with stars, crowns and backpacks (Figure 7), their operation could facilitate the development of quality tourism in the field of rural tourism.

3. Trademarks of local products

The local product – citing the Handcraft strategy- is a commodity that is the product of a manufacturer who lives in the local, sub-regional (ethnography (small) landscape) environment.

According to the government decree – 11/2013. (III. 5.) VM decree- the product is considered a local product if it is a traditional product defined as local product that is native, produced or manufactured in the area that falls under the competence of LEADER HACS.

3. 1. The Traditions-Tastes-Regions program trade marks

The Traditions-Tastes-Regions (TTR) program was launched in 1998 by the Ministry of Rural Development to join the European Union's Euroterroirs (Europe's Regions) initiative (Kovács, D. 2003)._As a result of the program a collection of Hungary's traditional and

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regional agricultural products and foodstuffs was created in order to allow the economic utilization of these special products.

The Ministry intended to expand the market opportunities of the high-quality local products with the TTR-trademark and has set the objective of winning and strengthening the trust of the consumers. The Ministry is committed to make the TTR- trademark stand for uniqueness, preservation of traditions and guarantee of high-quality.

Figure 8: The Traditions-Tastes-Regions (TTR) program

Source: edited by authors, Association of Rural Tourism and Agrotourism 2015

The TTR collection was published in print and an electronic version is available as well, its content can be downloaded from the Agricultural Marketing Centre (AMC) website (www.amc.hu), now hundreds of products can be found on this website. The necessary conditions for the trademark are the following (AMC 2015):

- It has an at least two generation (50 year) old documented history,
- It is connected to one or more landscapes of Hungary,
- It has a traditional, local method of production,
- It is regularly or periodically produced, marketed product,
- The Traditions-Tastes-Regions (TTR) program's aim is to protect and preserve the origin and special properties of the traditional, high-quality foods, and it also helps the conscious consumer choices,
- The consumers are becoming more conscious when they pick from the stores' supplies, search for the domestic, high-quality foods that were made using a

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traditional or special method. In addition to the price, it is increasingly determining which food contains fewer additives, which one is artisan, traditional or regional product, which one was made with a special local method,

- The TTR program was created to collect and preserve values, which has become a collection of hundreds of traditional and regional agricultural products.

3. 2. The Door database

In the European Union the agricultural products and foodstuffs that are registered with protected designations of origin and protected geographical indications as well as the guaranteed traditional specialities can be found in the DOOR database.

The Hungarian Council for Origin Protection (MET) gives opinions on the specifications and the modifications of the specifications of the agricultural products and foodstuffs in the national stage of the reviewing procedure of the EU protection. The Hungarian Council for Origin Protection – based on the government decree 1374/2013. (VI. 27.) - is the government's opinion-giving, proposal-making consultative body power during any administrative procedure related to the geographical indications of the agricultural products and foodstuffs, as well as to the recognition of the traditional specialties.

MET is composed of representatives of the competent authorities and original protection specialists. The EU regulation for the common organization of the markets in agricultural products (Regulation EU no 1308/2013) for each product (for example: cheese, dairy products, ham, wine) that bears protected designation of origin or protected geographical indication regulates separately the possible derogations from the general rules, the possibility of any compulsory or restrictive national legislation.

According to the MET guidelines:

- In the case of products with protected designation of origin, the product and the delimited geographical area are in a strong connection, all the phases of the production, elaboration and the preparation must take place in the given geographical area.
- In the case of products with protected geographical indication it is sufficient to have connection only in one of the phases. Thus the raw material for elaboration can derive from a greater area than the delimited one, it has to be defined in the specifications of the product.

4. Other trade marks

A trade mark to qualify spas has been introduced to the field of other trademarks, at the certification the bath units have to be evaluated separately as well. Furthermore, the process of the qualification of water stops has commenced, however its effects on the rural tourism cannot be detected yet.

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Figure 9: The baths used for qualifying mark

Source: edited by authors, www.nfh.hu/nod/8622

5. Conclusion

To sum up, we can say that by all means the introduction of the sunflower trade marks' system by László Csizmadia has set prosperous developments afloat in the field of rural tourism (Csizmadia, L. 1992). It would be rewarding to introduce additional trademarks so the visitors could gain more trust in quality, which contributes to the development of the responsible rural tourist model. The operation of the trademarks promotes the local products' improvement and their presence in the market (Kósa, L. 1984,1998). The local products can even gain such a reputation in the TTR and DOOR programs that they may become part of the world heritage within the foreseeable future.

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The economic role and opportunities of Hungaricums (national values) as endogenous resources in local development

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Abstract
On the one hand Hungaricums like specific national values play an important role in the Hungarian national identity; on the other hand they are considerable economic factors too. The majority of Hungarian specialties like local resources are linked to rural areas. In the rural policy of the European Union and Hungary it is a special priority to support the development based on endogenous, local resources. In our opinion, adequate economic utilization of the Hungaricums products and values can provide many opportunities for development of rural areas. After grouping the Hungarian national values our study is linked to two Hungarian products, Gönc "pálinka" (apricot brandy) and Tokaj wine. We explore how the various economic participants value the impacts of national and rural economic importance of Gönc „pálinka" and Tokaj wine like hungaricum products. Our research extends that the stakeholders what kind of opportunities can pair to special products which symbolized Hungarians.

Keywords: *agriculture, tourism, local development, rural development, rural economy, national values*

JEL: *O13, J43, Q19*

Introduction

The falling role of agriculture which used to employ quite a large proportion of people living in rural areas, have caused problems particularly in the former agricultural areas that cannot integrate into the global economy (Agarwal et al. 2009). It seems that the decline of the former role of agriculture in employment ruined the adaptability of several areas, resulting in - among others - significant and long-term unemployment. This is supposed to have contributed to the growth of territorial disparities (see Ritter 2010). Considerable changes have occurred in Central East Europe. During the last decades out-migration has accelerated in many rural areas. Several rural micro-regions have indicated negative demographic tendencies, a quite unfavorable age structure and a decrease of economically active persons and low qualification of human resource (SERA 2010). Small villages can hardly provide local job opportunities apart from agriculture. Due to scarce local employment opportunities only a small proportion of employees in villages can find local job, so most of the locals are daily commuters. In addition, a great proportion of the rural population have unfavorable or have no access to basic services. Rural areas also lack recreational and cultural services which is one of the main reasons for out-migration of young people. Moreover, many road networks, service and storage facilities, public utilities, energy supply are insufficient and in poor condition (Ritter et al., 2012). It was recognized that these problems cannot be remedied by interventions aimed at developing agriculture alone. Rural areas have already required a new approach and area-specific developments beyond agriculture (e.g. OECD 2006, Ritter 2014).

The global economic tendencies, the globalization and the spatial restructuring of the European economy have led to the increasing importance of the spatial policy recently. One of the basic consequences of the globalization is the change in the role of territories and

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localities as well as their increasing value, resulting that the creation of the conditions for development is not merely the governments' responsibility, but also it has become the duty of the settlements and territories due to the emphasis on the endogenous theories and building on the own resources. The endowments and potentials of the territories have come to the frontline (especially the human capital), which are available for the developments as internal resources and can be activated under appropriate circumstances (Káposzta 2007). The main goal of that development is competitiveness.

According to Bristow (2005) since the 1990s, in response to the work of authors such as Porter (1990), the concept of regional competitiveness has become a main discourse within public policy in developed countries. Indeed, regional competitiveness has been enthusiastically adopted as a policy goal by the European Commission and by national governments across Europe (see EC 2000). The competitiveness hegemony is such that according to certain analysts, the critical issue for regional economic development practitioners to grasp is that the creation of competitive advantage is the most important activity they can pursue (Barclays, 2002).

Instead of the term lacks a clear, unequivocal and agreed meaning within the academic literature, according to a definition utilised by the European Commission regional competitiveness describes the ability of regions to generate high income and employment levels while remaining exposed to domestic and international competition (EC 1999).

As a result of globalization, local developments - relying on local resources - came to the foreground. Endogeneity has been the response to the critique related to the vulnerability and over-dependency of extra-local forces in rural development (Ray, 2000). Terluin and Post (2001) emphasized the importance of local resources, activities, actors and the integrated approach in endogenous development. Based on our researches empowerment of local actors in the design and implementation of development are really essential to endogeneity (Kassai, 2014; Kassai - Farkas, 2012; Ritter et al., 2013). The development of micro-regions in Hungary are carried out along the priorities represented by associations of local governments, organizations set up by local players of several settlements to achieve common development and the economic action groups of rural development.

The essence of all the efforts is that the aims to be achieved and the related strategy are defined by the local population. The territories require various development strategies due to their special conditions. It is also important which programs can be implemented with the contribution of the local population (G. Fekete 2000). The significance and actuality of *local economic development* (LED) cannot be questioned regarding the development of the Central-Eastern European regions (see e.g. Nagy - Káposzta, 2006; Káposzta - Nagy, 2013). The role of LED has significantly increased for the last decades, since the local economies need to face more and more difficulties, such as globalization, economic crisis, national and regional challenges and their negative impacts (see e.g. Káposzta, 2014).

More specific, local economic development (LED) offers local government, the private and not-for-profit sectors, and local communities the opportunity to work together to improve the local economy. It focuses on enhancing competitiveness, increasing sustainable growth and ensuring that growth is inclusive. *"The aim of LED is to create the economic capacity of an area so that it could provide the future of the economy and the appropriate standard of living for the population. This is a process in which the state, the local government, the private and the business sector work together to create more favorable conditions for the economic growth and the labour market"* (Swinburn et al., 2004: 11. p.). LED refers to the above mentioned endogenous development approach as well, because according to Picchi (1994:

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195. p.) "*endogenous development is to be understood as local development, produced mainly by local impulses and grounded largely on local resources*".

Within rural policies the emphasis has long been shifted towards rural diversification, support for indigenous business, encouragement of local initiatives and local enterprises, provision of suitable training and bottom-up approach (Lowe et al., 1995). Based on LEADER program, which has become an important element of rural development policy since 1991 with a high level of acceptance all over Europe (see Kassai - Farkas, 2007), the EU put a big emphasis on community-led local development (CLLD) in the 2014-2020 programming period. CLLD is a tool at local level in developing responses to the social, environmental and economic challenges including the civil society and local economic actors in designing and implementing local integrated strategies that help their areas make a transition to a more sustainable future. Community-led local development shall be:

- focused on specific sub-regional areas,
- led by local action groups composed of representatives of public and private local socio-economic interests,
- carried out through integrated and multi-sectoral area-based local development strategies,
- designed taking into consideration local needs and potential, and shall include innovative features in the local context, networking and, cooperation (EC 2014).

In this programming period (2014-2020) economic and employment growth is the long term objective of the European Union. The rural development policy retains the long-term strategic objectives of contributing to the competitiveness of agriculture, the sustainable management of natural resources and climate action, and the balanced territorial development of rural areas in line with the Europe 2020 strategy (see EC 2010). Based on the economic, social, environmental and spatial challenges of rural areas, these broad objectives are given more detailed expression through the following six EU-wide priorities (see EC 2011):

1. Fostering knowledge transfer and innovation in agriculture, forestry and rural areas;
2. Enhancing competitiveness of all types of agriculture and enhancing farm viability;
3. Promoting food chain organization and risk management in agriculture;
4. Restoring, preserving and enhancing ecosystems dependent on agriculture;
5. Promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors;
6. Promoting social inclusion, poverty reduction and economic development in rural areas.

The Government of Hungary passed the comprehensive and long-term strategy of the rural development, namely the National Rural Strategy (NRS) 2014-2020. It defines tasks to be carried out in four major fields: agribusiness, rural development, food industry and environment protection. In addition to the major objective (improving the capacities of rural areas to attract and keep population) the Strategy sets five strategic objectives (NRS 2012):

1. The preservation of natural values and resources,
2. Various and viable agricultural production,
3. Food and nutrition safety,
4. Providing the basis for rural economy, increasing the rural employment,

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5. Strengthening of rural communities, improvement of rural standard of living.

The horizontal aspects that need to be taken into account during the elaboration are: sustainability, spatial and social cohesion and the recovery of urban-rural relations. These are important from wider, regional point of view as well (see Péli, 2013).

In the last decades significant changes and increasing territorial differentiation could be observed in the rural areas of developed countries, mainly in Western Europe, but - parallel with the political and economical transformations in Eastern-European Countries - all over the EU. These changes have been accelerated by the unequal expansion of economical and social effects of the globalization that affect rural areas and settlements, their development and local economy differentially (see Byrden and Hart 2004). One of the most important elements of the changes is the strengthening and changing of the expression *rural*, since it has meant a totally different and new dimension for the society and the economy in the developed countries for a while. It has been shown by the suburbanization, re-evaluation of natural resources, economic development of a certain part of the countryside (see the term "*new rural economy*" by Clout 1993) etc.

For a long time, rurality was defined by the predominance of agriculture in the economic activity, in the social and environmental context and in the ethic values of an area. Now, the transformation made in the European economy and the wide distribution of industry and services in the territory have profoundly modified the rural dimension, resulting in growing integration between city and countryside and valorization of the multifunctions of rural areas. According to multifunctionality which is one of the main basic elements of EU's rural policy the income of rural communities is not exclusively gained from the primary function - food and raw-material production - but more and more from the other functions as well. In this "European model" rural areas have also intensifying ecological/environmental, social, economical, social, cultural functions. These could be involve the creation of the right recreational and touristical conditions, the support of SMEs, the care of rural communities, maintenance and sustaining of landscape, cultural heritage and traditions, environmental protection etc. (Kopasz 2005). Besides these multifunctions the competitive agricultural sector adapting to global market economy still plays important role ensuring right and stable level of income and quality of life for farmers in the EU.

From the point of view of endogenous and local development theories the Hungarian National Values could be special resources. Hungarian National Values are unique products of Hungarian intellectual, cultural, artistic activities or special knowledge, traditions or natural values that are characteristics of the whole country or at least a certain area of Hungary and are recognized as special national character abroad as well[1]. The National Values involve the following main groups:

- Agriculture and food-processing - intelectual and material products of agriculture (according to the main goal of this paper especially food and vinery);
- Health and wellness;
- Architectural environment;
- Industrial and technical solutions;
- Cultural heritage: intellectual and material elements of cultural heritage, folk art, outstanding monuments, and world heritage sites;
- Sport;

[1] Source: XXX./2012 law on Hungarian National Values and Hungaricums.

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- Natural environment;
- Tourism

Based on the literature and our researches (e.g. Ritter et al., 2015, Virág et al., 2014) the interpretation of National Values as unique, endogenous resources - even in international level - is unquestionable. In most cases the origin or the usage of these values is strongly related to rural areas therefore they could be bases of endogenous local/rural development actions/strategies. They can contribute to the long term objectives of the EU's and Hungary's rural policy creating and maintaining a diversified rural economy by helping competitive and marketable agricultural production, generating better quality of food, sustaining traditional ecosystems, preserving the landscape, the natural and the cultural heritage, strengthening employment expansion and in the most integrated way through rural tourism.

The tourism product is a set of products, services, experiences, which aims to the needs and motivations of tourists are met in a complex way. The tourist attraction is the base of torurism product (Lengyel 1992, Michalkó 2004). Tózsa and Zátori (2013) determine, that it is important to integrate the Hungaricums to tourism product, individual, authentic, distinguishable destination products can be created based on these values and touristical resources or attraction-elements. However, the Hungaricum as a tourism resource in itself is not success factor. Properly need to communicate it to consumers. The information service is a key factor in finding the unique values and promoting the hungaricums in tourism. It is necessary for the domestic segment (and Hungarians beyond borders) to communicate the Hungaricums as a brand and emphasized product, in case of foreign segment it is more important that the hungaricum are involved in the product development so the domestic offer will be distinguished in the international tourism market (Tózsa - Zátori 2013).

Material and methods

Economic development based on the endogenous resources represent a breakthrough point in the long-term development for many domestic subregions. In our study we examined territorial impacts of the Gönc "pálinka" (which is registered in Hungarian Depository) and the Tokaj wine (which is a Hungaricum product).

The first phase of our research delimited production area of origin protected products via the analysis of secondary data so the investigation was limited to the affected settlements (Figure 1. and Figure 2.). Based on historical and geographical reasons we were examined in the Tokaj wine region on the basis of the boundaries of the Hungarian characterization. After the demarcation secondary and primary data collection was carried out and analyzed the obtained data. The secondary data collection was focused on statistical data of the affected areas. Among others we have studied the Central Statistical Office database and data of the Hungarian National Tourist Office.

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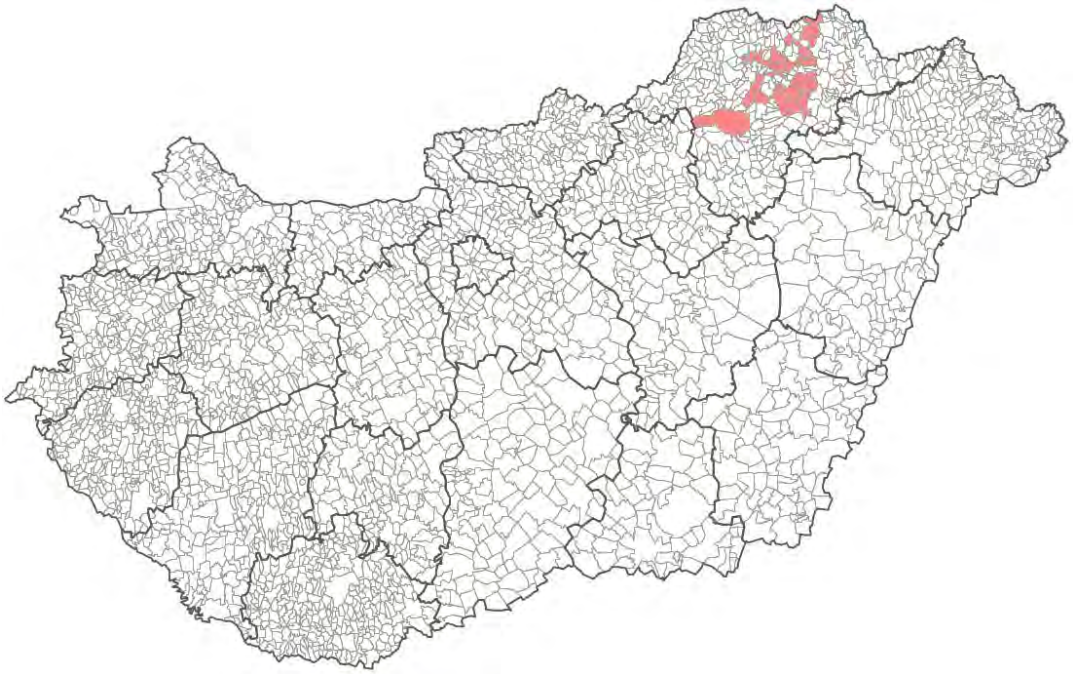
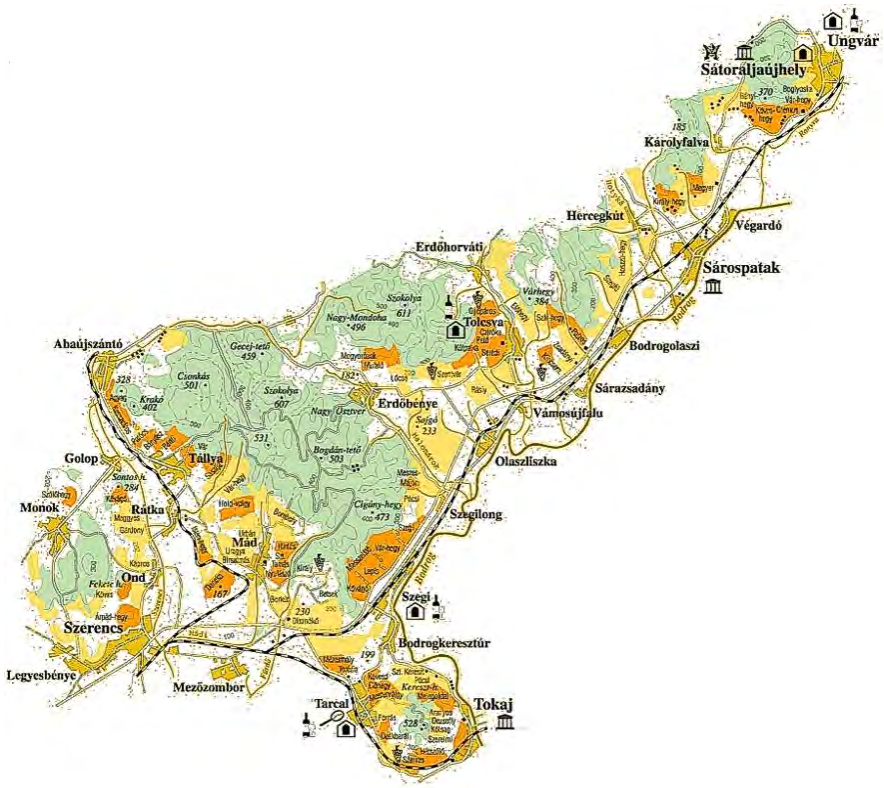
Figure 1. The area of origin protected Gönc "pálinka"



Source: own edition, 2016.

Figure 2. The Hungarian area of Tokaj Wine Region



Source: http://www.tokajiborvidek.hu/?id=terkep

In addition, we investigated the rural development situation analysis and local rural development strategies of LEADER Action Groups, and other development concepts for

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relevant areas. By the analysis of the plans we aimed to reveal, that are the hungaricums and associated measures appeared in these documents, if so, have they adequate emphasis.

In addition, we performed the primary data collection. In two examined regions we made 132 depth interviews with various economic and rural development actors (fruit growers, employees of distilleries, mayors, representatives, project-managers, leaders of civil society organizations, tourism service providers etc.). The interviews were made in February and March 2014 and the summer of 2015.

During the interviews we used the following main questions:

- What is the role of the Hungaricum products in economic development?
- How can the endogenous products contribute to the development of the rural regions?
- What kind of development opportunities can be linked to the Hungaricum products?
- What extent is built on local products in local development plans?
- How much known the two premium Hungarian products among domestic and foreign visitors?

Based on the specific features of the products (Gönc „pálinka" and Tokaj wine) and the literature we formulated some hypotheses before investigation:

- The hungaricums are special, unique, specific endogenous resources of certain territorial units, which pose the possibilities of economic development directions.
- The hungaricums as specific endogenous resources contribute to expansions of local developments, economic opportunities, job creations, the improving the quality of life of the inhabitants in the given subregions which help the development of rural economy.
- The presence of hungaricum products in local development plans, concepts are not adequate, do not enjoy significant economic development priorities.

Results

Due to space limitations, we only describe the most important results, especially in support of the literature. The method is the descriptive statistics.

We asked rural operators to differentiate among domestic and foreign visitors to the notoerity of Gönc „pálinka" and Tokaj wine, as they are in contact both layers. We assumed that we will find a difference between them. Respondents placed the hungaricum product in the four measurement scale (not known, slightly known, relatively known, known to everyone) according to their own opinions. Based on the responses the domestic product awareness (3,79) (virtually everyone is familiar with it) is much higher than foreign (1,14) (practically no one knows). According to respondents, the Gönc „pálinka" not specifically as „apricot from Gönc", but as a good "brandy" contributes to the country's image. This is supported by the fact that the foreigners are looking for a good brandy in these areas. We asked the respondents to place the national recognition of the Gönc „pálinka" between the hungaricum brandies. Virtually all respondents ranked the product to the top of the imaginary list, only difference was that clearly placed in the first place, or any of the first three places.

Tokaj wine is definitely to contribute to the country's image; all respondents emphasized the domestic and the international notoriety too. The products of Tokaj Wine Region as World Heritages are famous all around the world, the majority of domestic and foreign tourists

purposefully looking for Tokaj wines. It is typical that the respondents considered the Tokaj wines standout Hungarian product in the case of the wine industry and wine tourism too.

Of course more specific, national-level studies are needed for an objective judgment. In any case clearly can be drawn, according to the locals the Gönc „pálinka" and Tokaj wine is exceptional local resource which has national recognition, they are proud of products.

The wider territorial impacts of the Gönc „pálinka" and the Tokaj wine as Hungaricum were agreed by all respondents. Based on the results of the investigation these effects are not significant for the affected regions and its inhabitants (only 4% of respondents thought the opposite). However, they carry potential which substantially can contribute to the economic and social development of rural areas according to nearly three-quarters of the respondents (73,91%).

The most important regional impacts based on the respondents' opinion:

- Income of distilleries and wineries;
- Local tax revenues;
- Employment creation;
- Local raw material supply - more secure sales;
- Alternative income and diversification opportunities for local farmers;
- Stimulation and promontion of local hospitality and tourism;
- Gönc „pálinka" and Tokaj wine, as trademark contributes to the region's visibility, advertise;
- Extern effect on other local products.

Examine the appearance of the Gönc „pálinka" and brandy sector, the Tokaj wine and wine sector in the local development plans, concepts. Between the local development strategies of the affected regions there was some, which counted with the hungaricum products as endogenous resources and local products.

In some local rural development strategies these products are mentioned as a flagship feature. However, most strategies have not been treated separately / particularly the impact on local development of these concerned products, be stated that in these regions lots of development were realised in the previous programing period (2007-2013), which directly or indirectly belong to the product chain of brandy and and its touristic opportunities.

The development activities contribute to the wider improvement of economic, social and natural environment in the rural areas. However, all respondents confirmed thet need to strengthen the place and role of Gönc „pálinka" and Tokaj wine in local development plans.

Conclusion

The importance of the competitiveness and the local development increases in our country. The local endogenous resources can play a significant role, like the foundation stones of construction based on own resources. The determination, the exploration, the acquisition or establishment of factors have become top priority which as a starting supply elements contribute to 'independent' socio-economic development in a specific area.

The literature based on the local, endogenous development projects and theories, as well as relevant research also outlines the hungaricums as special, unique and competitive resources have/ may have role (territorial significance) in regional development.

The appearance, the production of Hungaricums (which are often linked to the agricultural sector) and their economic and social activities, and their wider territorial impacts regarded as a competitive factor in rural areas. It has significant potential for rural development in the definition of development policies and their implementation.

Our studies have mapped the spatial territorial effects of hungaricum products that have impact on the society and the economy of the affected regions.

The research fully confirmed the Gönc „pálinka" and the Tokaj wine rightfully earned the hungaricum "trademark" because they are special, special resources in international context too.

The apricot brandy from Gönc „pálinka" and Tokaj wine as endogenous resources affect to social and economic processes and development opportunities of rural areas. The proper exploitation of these potentials can be one of the driving forces (if not the sole and exclusive) of local development.

Based on the interviews all three hypotheses are regarded as confirmed/true:

- The hungaricums are special, unique, specific endogenous resources of certain territorial units, which pose the possibilities of economic development directions.
- The hungaricums as specific endogenous resources contribute to expansions of local developments, economic opportunities, job creations, the improving the quality of life of the inhabitants in the given subregions which help the development of rural economy.
- The presence of hungaricum products in local development plans, concepts are not adequate, do not enjoy significant economic development priorities.

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Accessibility as a major determinant of rural regions

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Abstract
Accessibility and proximity are two of the most important factors of regional development. Without well-developed transport infrastructure, goods, people and capital cannot flow between the elements of the settlement networks.
There have been many studies dealing with the role and importance of motorway networks in regional development. This is an important issue, because government spend large amount of money aiming to improve the situation of both lagging behind and already developed countries. However, there is no clear evidence which would suggest that these financial resources are useful or not (or if so, to what extent?).
This paper aims to present some relationship of lagging behind areas in Hungary, being mostly in the countryside, and their proximity of important spaces, such as the capital city (Budapest) and the centres of NUTS 2 regions.
The paper concludes with evaluation of the research results, which can shed some light on the relationship of motorway infrastructure and regional development.

Keywords: *accessibility, rural areas, transport infrastructure*

JEL Classification: *O10, O18, R10*

1. Introduction

Accessibility is one of the major factors of regional development. Countries and regions with not sufficient transport infrastructural endowment and accessibility must face serious difficulties. For instance, people of those areas will not have the means to access to as many services and jobs, reducing their chances to successfully find workplaces or to live a high quality life.

The level of accessibility also determines many other processes and activities. There are significant differences between the regions of the world, and the primary cause is population flows (Káposzta, 2014). Therefore, it is logical to assume that the easier for people to flow from one region to the other, the larger the territorial differences may become. On the other hand, population flow might lead to disparities in one region, but can potentially decrease them in the other one. From a company perspective it is also important to note that firms need to get inputs for their operations and they also need ways to send their outputs to the market, to the customers. Even in the case of services, such as hairdressers, which do not produce physical goods, accessibility is vital so customers can reach the providers.

The case of regions is similar. If there are accessibility problems the certain areas cannot gain profit from tourism, cannot transport their goods to other regions (thus not be able to maintain their export) and the flow of people, goods and services is not ensured. That is one of the main reasons behind the European Union's transport policy as well. It is among to main priorities of the transportation branch of the Trans-European Networks (TEN-T) is to "ensure the sustainable mobility of persons and goods within an area without internal frontiers under the best possible social and safety conditions, while helping to achieve the Community's objectives,

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particularly in regard to the environment and competition, and contribute to strengthening economic and social cohesion" (Eur-Lex, 1996).

Creating pan-European plans for building connections, networks, ensure the development of the Single Market, which is closely linked to spatial equalisation. It is a key issue in the European Union. In the case of the Visegrad countries, for instance, it was proven that their economic situation showed considerable diversity even at the time of their EU accession, which was further amplified by the use of European Union's Structural and Cohesion funds (Káposzta-Nagy, 2015). This is only one evidence that territorial cohesion is still far from being achieved; however, improving transport infrastructure is one way to support this goal. There are certain resources, such as water, which are difficult to transport and store (Fogarassy et al. 2014). But that makes the role of transport infrastructure even more important.

2. Data and Methods

The paper deals with the importance of transport infrastructure, proximity and accessibility related to regional development. To this end related literature was analysed to create a background for later secondary research.

The secondary research used data from the Hungarian National Spatial development and Settlement planning Information System (TeIR), the EU Statistical Yearbook from 2014 and a study created by the European Observation Network for Territorial Development and Cohesion (ESPON) (2009).

The goal of using these materials is the following: firstly, the author tries to see the relationship between the competitiveness and accessibility of European regions. For this end, road and railway accessibility data was collected. The freshest data, collected by ESPON, was from 2006. This seems to be very outdated, but it must not be forgotten that infrastructure needs a lot of time to change; therefore, we can assume that the data from 2006 may not be perfectly applicable, but is a very good lead on the situation nowadays. The data on competitiveness is from 2014, it can be considered absolutely up-to-date.

The next section deals with the Hungarian situation. For this reason three types of data were collected (the distance of regions from Budapest, from the centres of NUTS 2 regions and from motorways). The newest available data was from 2010, but similarly to the previous case, transport infrastructure needs a great deal of time to change, so it can be considered punctual. The abovementioned three data are presented on maps, which are then compared to a map of the most-lagging behind rural areas of Hungary, to see if which regions are the most accessible and which can access to other important areas.

3. Results and Discussion

3.1 The relationship between accessibility and competitiveness in Europe

In many countries, for example, in Hungary, it was found that there is a strong correlation between the motorways and high development level of the centre areas (Péli, 2013). This seems to be true in global scale as well. We can observe the relationship between competitiveness and accessibility by examining Figures 1 and 2, comparing them with the data of Figure 3. Figure 1 demonstrates the potential accessibility (an indicator created by ESPON) of European NUTS 3 regions by roads.

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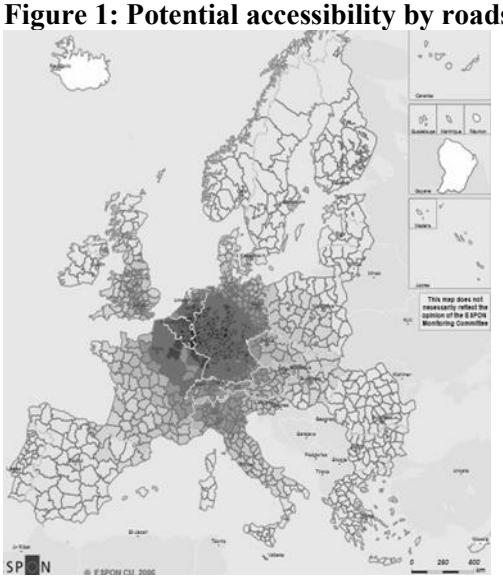
The darker the regions' colours are, the better their accessibility is. The figure clearly shows that some German, Belgian, Dutch, Austrian, Swiss and French regions are the most accessible. This result is not surprising, them being among the most developed countries in the world.

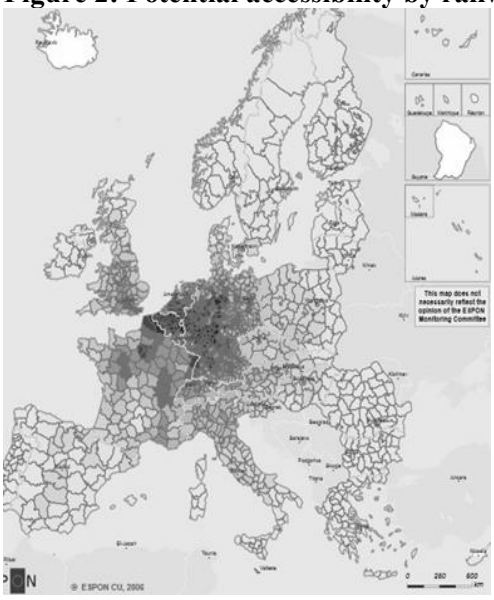
Figure 1: Potential accessibility by roads, 2006



Source: ESPON, 2009

Figure 2 shows similar results, this time, about railways: regions which are economically more developed (according to, for example, their GPD or GDP per capita) have better accessibility.

Figure 2: Potential accessibility by railways, 2006



Source: ESPON, 2009

The competitiveness of European Regions is illustrated by Figure 3. On the figure the blue-coloured regions are the most competitive. We can observe that the most accessible regions (both by road or railways) are typically the most competitive as well.

According to OECD (2003), competitiveness is „a measure of a country's advantage or disadvantage in selling its products in international markets". Based on that statement it can be assumed that countries with better accessibility (an advantage) can sell their goods more easily on the international market (despite other disadvantages). On the other hand, countries with low accessibility (a disadvantage) will not be able to connect to global or macro-regional trade.

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Figure 3: The competitiveness of EU regions

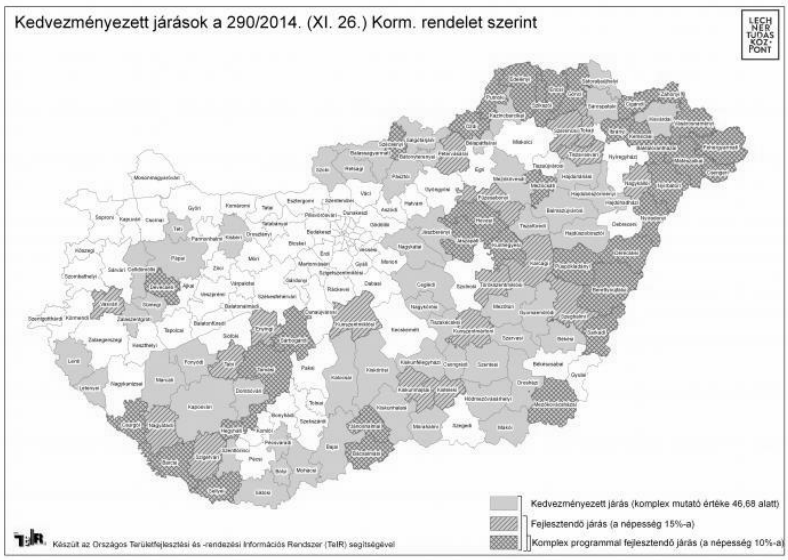
Source: Eurostat Statistical Yearbook, 2014

Accessibility and economic development are closely related to each other. The exact correlation is not known (and cannot be/have not been calculated) yet, but it is certain that transport infrastructure is one of the determinant of regional development.

3.2 The accessibility of rural areas in Hungary

From 2013 Hungary adopted the district system (replacing in the micro-regions administratively). It is important to establish that most of the Hungarian districts are rural ones (based on their population density and economic indicators). Figure 4 shows those districts which receive more government support (in the form of special measures and programmes) than the others.

Figure 4: The most lagging-behind districts in Hungary (2014)



Source: Térport.hu, 2016

There are three categories these districts can be classified to: *beneficiary districts*, *districts to be developed* and *districts to be developed by complex programmes*. This categorisation works like a scale where the first is the most developed one from the three and the last one is the least

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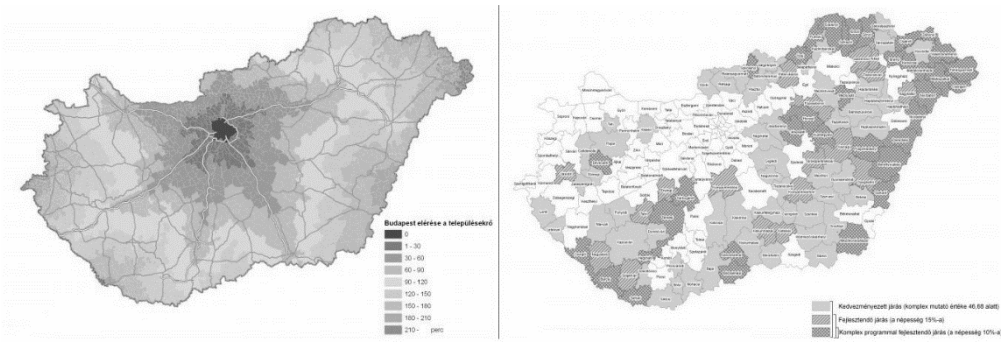
developed, based on socio-economic indicators. On the figure the dark colours represent the three abovementioned categories. Also, the darker the colours are, the least developed the districts are. The darkest areas on the map can be found in the North-Eastern, Eastern and South-Western areas of the country. These parts are historically known to be underdeveloped. The North-Eastern part is underdeveloped mostly due to the structural changes in the economy after 1990 (there have high level industrial production concentrated in those parts earlier). The Eastern parts are too far from Budapest and the Western border and the South-Western areas are both far from Budapest and have a unique settlement structure which is difficult to maintain.

We can generally assume the most developed regions in Hungary are those being close to the Capital (that is why all the NUTS 2 regions are Convergence regions, except for the one Budapest is situated in). It is not surprising, therefore, to see that regions which can reach Budapest easily (in a short amount of time). If we compare take a look at Figure 2 it looks obvious that those areas from which Budapest can be reached fast perform better. On the left map of Figure 2 the different colours represent different amounts of time the Capital can be reached in. The darker the colours are the faster it is to get to Budapest from them. There are darker colours at the borders as well, but in their case it means they are even further than the lighter areas (in their case it may take more than three hours to reach Budapest on roads). The next Figures will contain comparisons between maps (an accessibility map on the left and the map of lagging behind rural regions on the right).

Figure 4: Distance from Budapest (2010) and the lagging-behind areas in Hungary (2014)



Source: The author's own editing based on TeIR, 2016

However, the distance from Budapest is not the only important factor. We can observe that regions coloured yellow on Figure 2 are not necessarily among the weakest-performing areas. For instance, neither Miskolc, nor Debrecen or Nyíregyháza (cities among the top 10 settlements in Hungary based on their population numbers) are all among the underdeveloped regions, even though they are located relatively far from the Capital.

The next figure (Figure 3) is about comparing the position of lagging behind regions with the accessibility of the centres of NUTS 2 regions. The figure below shows similar results to the previous one: areas close to Budapest generally perform better than others. Also, Figure 3 demonstrates that the NUTS 2 region centres have strong gravitation fields, since settlements being close to them also on higher level than others. This statement is not true in every case, though. In the case of Miskolc (North-East) and Pécs (South-West) we can observe that not all the regions are successful from which these cities can be accessed easily.

Based on Figure 3 we can assume that accessing to region centres is a very important factor, but not the only one. Although it is true to every regions of Hungary that the centres of these regions are the most-endowed with jobs and services, there are other factors influencing the position of settlements besides being close to these centres.

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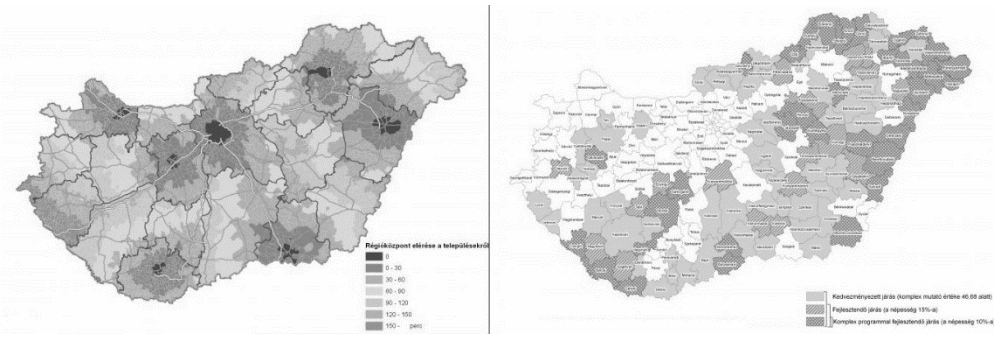
Figure 5: Distance from the centres of NUTS regions (2010) and the lagging-behind areas in Hungary (2014)



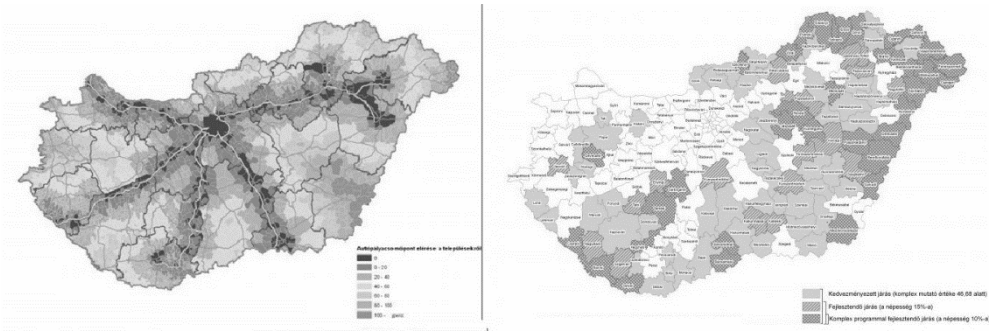
Source: The author's own editing based on TeIR, 2016

Natural resources, human resources and capital are some of the success factors. It is a huge advantage to have a strong community in settlements which is proactive, and willing and able to participate in development activities. Ritter et al (2013) also points out that there is an urgent need for the designing and the implementation of bottom-up local economic development strategies, which are based on the local resources, and which connects and coordinates the local actors. This way the development subsidies will be spent on actions aiming to solve real problems the locals face. Also, it is important to mention knowledge, experience and readiness to learn for the decision-makers (on national, regional and local levels as well), since these are among the most important qualifications of modern managers of municipal partnerships (Lubimow 2014).

Besides the proximity to Budapest and to the regions' centres, however, there is still at least one factor which is important to investigate, in regard to accessibility: the proximity from motorway hubs.

The motorway network – and generally, the transport infrastructure network – of Hungary is very Budapest-cantered. As it is demonstrated on the left map of Figure 4, every motorway is interconnected in Budapest. However, making it easier for people to reach Budapest is not the only importance of the network: it helps reaching region centres, micro-region or district centres, tourist spots, other settlements with jobs and services etc. Therefore, the proximity from motorways is a very general and important advantage (or, if being far from it, a disadvantage) for settlements. This phenomenon is clearly demonstrated by Figure 4.

Figure 6: Distance from the motorways (2010) and the lagging-behind areas in Hungary (2014)



Source: The author's own editing based on TeIR, 2016

The darker the areas are on the left map the closer they are to motorways. By comparing the two maps on the figure above, we can establish that districts with good motorway accessibility do generally perform better than other ones. Motorway infrastructure, similarly infrastructure generally, has long-term effects on the regions it crosses. This phenomenon can be observed in

Hungary too. Motorway M1 is the oldest one in Hungary, connecting Budapest to the North-Western border, Austria, since the 1980s, and it could successfully induce economic growth in its area. On the other hand, motorway M6 (towards South-East) only reached the Southern border in 2006. Figure 4 clearly shows that districts along the Southern part of the motorway are underdeveloped compared to the Northern ones, which were reached by the motorway already in 1997.

4. Conclusion

Although nowadays – due to technological advancement – the role of proximity has been decreasing compared to some other factors in economic activities, such as industrial production (Enyedi, 2011; Tiner, 2011), it is still a very important factor of regional development.

It was demonstrated that there is a relationship between motorways and regional development, since both in Hungary and Europe as a whole the regions with the best accessibility are also the best-performing/most competitive as well. There are some further questions, however.

One question could be that which one was first? Economic development or good accessibility? In other words: have the regions developed well because of their high accessibility (well-developed transport infrastructure), or could build good quality and numerous motorways due to their high levels of development?

Also, it is not clear whether the rural regions perform lower economically due to the lack of good transport/low accessibility, or it is only a coincidence. It should be noted at this point, however, that it is commonly agreed that transport infrastructure is one factor of competitiveness (for example, in the competitiveness report of the World Economic Forum). It means that even though the extent how much it influences economic development is not known exactly, it is certain that it is one of the bases of development. Therefore, and this study supports this theory well, it is an efficient way to develop rural areas by improving their accessibility.

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Silver tourism

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Abstract
The silver economy is an area of growth. Almost all economic sectors are expected to benefit from the silver economy. Sectors like cosmetics and fashion, smart homes, ITC, health services (including medical devices, pharmaceuticals and eHealth), fitness and wellness, robotics services, finance and insurance, safety, culture, education and skills, entertainment, transport and of course tourism are expected to gain the most from the emerging new field of economy. The elder generation's enthusiasm for travel is growing rapidly. However, „senior tourism" is not yet a clearly defined segment. The elderly are a heterogeneous population group with different consumption demands that can only be met by a correspondingly differentiated range of products and services. As a result of the growing demand, senior tourists are foreseen to become a powerful consumer group in the near future. According to my research, they have their own preferences whilst travelling, and thus, the good understanding of their needs is becoming extremely important for silver tourism providers, especially because Europe is expected to be the biggest actor in the silver tourism market.

Keywords: *age-friendly cities, medical tourism, silver tourism, silver economy, Hungary*

JEL Classification: *L83*

1. Introduction

The population worldwide is showing an ageing tendency, both in developed and developing countries. Modern gerontology research is expected to increase average life expectancy, and as a result, the average standard of living is also foreseen to rise. According to scientific prognoses, the second largest region affected by ageing will be the European Union after Japan. After the grey hair of senior people, European Union experts have named this phenomenon of ageing "silver economy". Silver economy is expected to affect almost every segment of the world economy in the near future. Of course, many scientists think that the existing economic models will be able to adapt to the upcoming trends, but the results of my research show that fundamental changes will be needed both at economic and social levels.

My study will focus on silver tourism, examining the aspects of tourism, demography, ITC, health sector, gerontology, life coaching and security technology. I have conducted interviews with experts of the field and then analysed their answers and opinions on silver tourism. My primary research consisted of surveys taken in 3 segments of the 50+ age group on their travel habits. As a result of my research, I aim to define the demand side of silver tourism, and I also wish to explore the forecasted trends and special characteristics of senior tourism in the near future.

1.1 The significance of silver economy

Silver economy has different perceptions worldwide. In Japan, the "robotic revolution" is considered as the only possible solution; meanwhile, in the Anglo-Saxon regions of the western hemisphere – in the USA, Australia and New Zealand - , silver economy is planned to be narrowed down to designated and easily controllable zones and city parts. In this aspect, the European Union has a clear and different vision of the possible solution, in line with the

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historic principles of solidarity. Based on the fundamentals of social and economic cohesion and by linking generations together, the EU aims to introduce the latest results of gerontology research and innovation technology into the daily life of the elderly.

It is evident that the population of Europe is ageing (L. RÉDEI, 2006). The trend is at the same time a great challenge and a huge possibility for the people of the continent. Based on the analysis of various research results, experts of the European Union has started to develop new programmes that aim to offer new solutions and alternatives for those who are willing to participate in the programmes. The three main programmes: Active and Assistant Living Programme (AAL), Horizon 2020 and European Innovation Partnership on Active and Healthy Ageing (EIP AHA) bring together market operators, high level business representatives and experts of the non-profit sector to work together and to get to know each other's demands better. As the increase in the number of senior people is well predictable, the first step was to name the segment by creating the term "silver economy". Silver economy includes the total economic activity of the 50+ population with all its expenditure-related products and demands. Actors that wish to fulfil the new market niche had already started experimental projects within the frameworks of the so called Living Lab programme that aims to asses senior consumers' demands under controlled circumstances and develop the best solutions and services for them. Among EU countries, the most advanced projects are in Lãnsi-Suomi, Finland, but new innovative experimental projects can also be found in Hungary; e.g. the Park Royal Resorts in Parádsasvár, where privately financed new innovative experimental projects targeting senior people are at the beginning of their implementation phase.

Figure 1. Top Ten Ageing Countries 2015-2030

	2015	**2030**
1.	Japan	Japan
2.	Germany	Germany
3.	Italy	Italy
4.	France	South Korea
5.	Spain	France
6.	United Kingdom	Switzerland
7.	Canada	United Kingdom
8.	Ukraine	USA
9.	Poland	Australia
10.	USA	China

Source: own edition

1.2 Segments of the silver economy

The next figure shows that the spending willingness of senior people affects almost every economic sector. As indicated by the figure, elderly people represent a huge market segment; however, marketing experts had not yet exploited this possibility.

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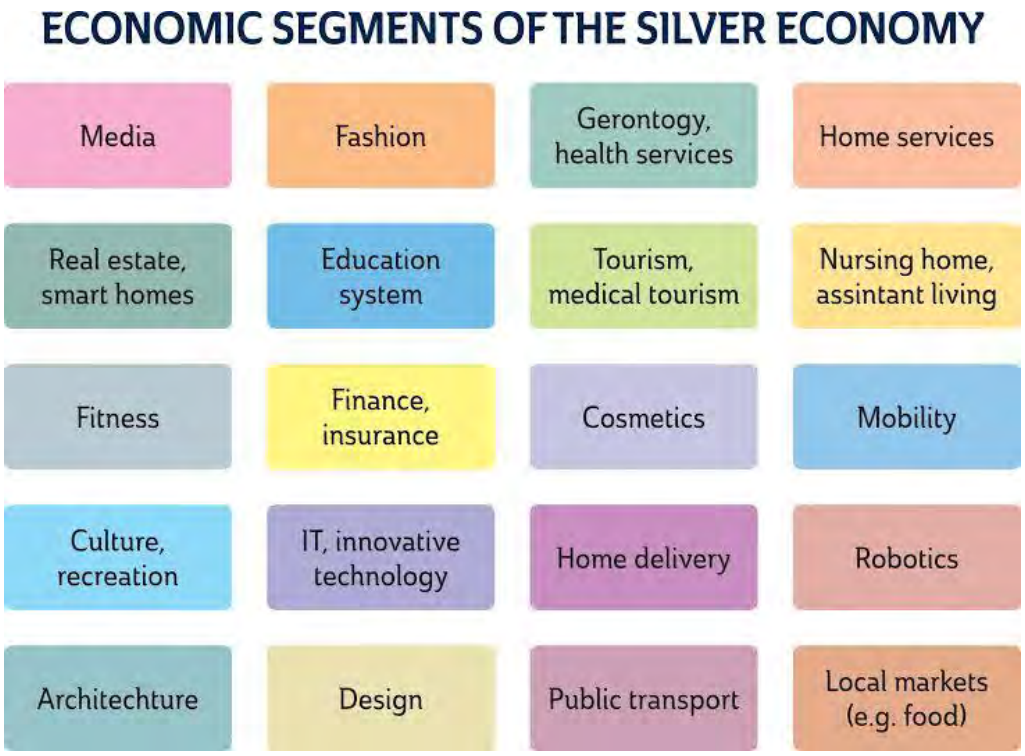
Figure 2. The impact of silver economy on economic segments



Source: own edition

The age group above 50 cannot be considered as a homogeneous group of elderly people; on the contrary, they can be divided into distinct heterogeneous groups. Age is a main distinctive feature: there can be decades of difference, which means that we can talk about "younger" and "older" senior people. Beyond this, there are other differentiating factors like gender, cultural background, acquired skills, life experience or health status. Taking all the factors in account, we can say that senior people are different.

In response to the challenges of the "greying century", new scientific fields have emerged. There are important researches going on in order to have a greater understanding of biological processes related to ageing. The science of gerontology examines the chronological changes in human life processes that affect everybody equally. For example, it is a general statement that the ageing of the body is a normal biological process, not necessarily accompanied by pathological lesions or diseases. However, the biological processes of natural ageing increase the vulnerability to diseases and accidents. With ageing, the body mass decreases, the movement ability decreases, cellular loss becomes continuous, the pain threshold becomes lower, blood pressure increases, lung capacity declines and muscular strength decreases; service providers must take all these aspects into account when developing targeted services for the elderly. Hereditary factors, environmental impacts, personal lifestyles developed in younger years, behaviour, social status, emotional and cognitive development, moral and ethical values and the accessibility to quality free time all affect ageing and life expectancy (IMRE, 2007).

The most important results of gerontology research are:

- human life expectancy can be expanded up to 150 years, of which around 30 years can be achieved by healthy lifestyle, genetic modifications and implant technologies;

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- intellectual performance can be enhanced by chemical, psychological and psycho-biological methods;
- the defensive-protective operation of the immune system can be influenced and modified by targeted dietetic programmes;
- the role function of elderly age is transforming, but there is no general pattern of ageing, because diseases affect life quality.

Different risk factors can emerge at any stage during the ageing process, but there is a so-called "healthy ageing process" (CZIGLER, 2000). According to this, elderly people become ill because they are affected by a disease, and not because they are old. Health issues directly related to ageing are more like movement coordination disorders, lack of stamina or dementia (HALMOS, 2002). I think that elderly people are gradually starting to realise the importance of a healthy lifestyle, and there is a tendency among them to open up towards regular physical activity and physical-emotional-intellectual harmony, and as a result, a higher level of empathy will emerge towards them.

1.3 Senior friendly tourism scene

According to present tendencies, the process of ageing goes on in parallel with today's trends of urbanisation. As a result, the population "urbanises" from rural and peripheral regions towards central areas (ENYEDI, 2002). City management bodies and urban planners will have to cope with huge challenges in the near future, when the development of senior-friendly spaces becomes a priority. The changes will greatly affect local people, living environments, existing road and pavement systems, utility and transport services, community spaces and parks, workplaces, shopping facilities, doctors' offices, schools, hospitals, public institutions and the whole settlement area and everyday life (PISKÓTI, 2012). The newly introduced term of senior-friendly accessibility will not only refer to a space developed especially for elderly people, but it will also mean a more user-friendly environment for the whole population. The decreased level of noise and electro-smog, the re-design of allotted passing time at crosswalks, the allocation of covered benches and resting places, the targeted distribution of public toilets and the re-organisation of the crossings of bicycle routes and pavements used by the elderly are all important innovations which will have a positive response from the senior citizens first. Such spaces with a higher level of safety will not only be suitable for the elderly: children, young single women and disabled people will also benefit from the changes. Safety is also a priority when it comes to tourism – as a matter of fact, it is the most important factor of decision making about destinations.

The definition of tourism space requires caution (MICHALKÓ ET AL, 2007). In terms of settlement marketing, the existing image of a destination is extremely hard to change (PISKÓTI, 2000). The implementation of senior friendly tourism scenes is a long-term process where the transformation of urban spaces is only part of the development. According to tourism experts, the possible innovative brand of „designed for older people" will spread only gradually.

Based on my research, the first step in the development of a senior friendly destination should be the quantitative clarification of the following questions:

- To what extent can a local community be senior-friendly?
- To what extent do local actors support senior-friendly development?
- To what extent can a tourism destination be senior-friendly?
- Which one is more probable: senior tourism or senior-friendly tourism?

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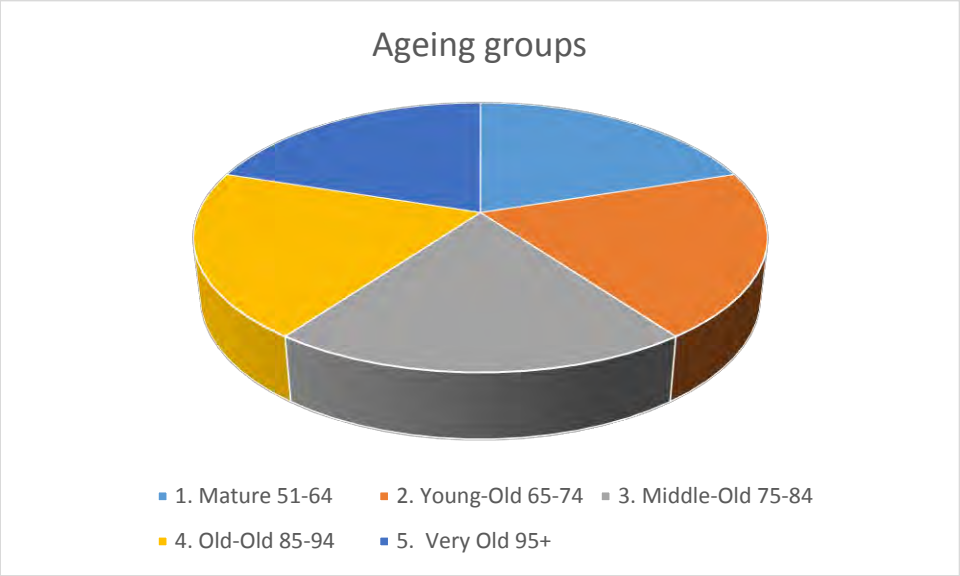
1.5 Silver tourism

The older generation is getting increasingly more committed to tourism. Members of the "silent generation" (KOTLER ET AL, 2012) have significant spendable income and is interested in exploring the world. A typical group of them is the Baby-boom generation, born between the late 1940s and mid-1960s. They typically buy travel packages, put an emphasis on the length of their stay at the destination, are interested in other cultures and open towards novel gastronomy trends.

From another point of view, senior tourists cannot be defined as a homogenous group. This is partially due to the fact that the age group of senior citizens (generally referring to 50+ people) itself consists of different generations. A two-generation model of parent and child(ren) can easily belong to the same group; in regions with higher life expectancy, even three generations: grandparent-parent-child(ren) can fall into the same category.

Figure 3. Phases of Aging



Source: own edition

In the figure above, five different groups are defined based on their age. Of course, other group definitions are also possible, but my statements below were developed on the basis of this differentiation, where the following conclusions are true in case of every group.

General characteristics of silver tourists:

- they have sufficient spendable income,
- according to demographic statistics, the majority of them are women,
- safety is a priority to them, and they will avoid catastrophe-struck regions,
- because they have a lot of free time, they can travel in any season,
- they are willing to expand their time spent at the destination, even at multiple times,
- they can be considered as "curious" tourists,
- they require more communication,
- they will seek medical and health services,

- they take each other's opinion and recommendations into account seriously,
- regarding transport, accessibility is more important for them than the means of travel.

The list above clearly shows that senior tourists require personal care and relationships. This indicates that they will prefer the customer-centred services of classic travel agencies over the information dump of internet sites.

Based on the results of my research, the following tourism sectors will be the most popular among silver tourists:

- medical and health tourism,
- visiting friend and relatives,
- luxury trips,
- luxury cruises,
- wellness/recreation/rehabilitation and life coaching,
- milestone tourism focusing on celebrating anniversaries,
- generation trips (grandparents with grandchildren),
- bucket list trips
- sex tourism (DÁVID ET AL, 2008),
- holiday clubs, time-sharing,
- trips including anti-aging services, organ transplantation or genetic therapy

An interesting finding of my result is that none of the interviewees was interested in getting to know other religions and religious habits. Great expectations used to be set for religious tourism related to visits to different holy places; the current scenario is probably a consequence of today's widespread migration situation that has resulted in a decreased sense of safety among senior people.

1.5 Hungary's position in the silver tourism market

Hungary has a great potential in the silver economy, and with successful management, the country can break into the world market as a destination. The Hungarian society itself is an ageing population that will force decision makers to act rapidly, resulting in a huge potential where economic sub-sectors, multinational companies will be able to test their developments and innovations in a smaller regional market. In comparison with the neighbouring regions, Hungary has excellent environmental conditions, can serve as a tourism gateway and offers cost-effective solutions. The demographic statistics of former political emigrants and the amount of foreign state pensions paid for alien citizens in Hungary indicates that there is already a significant group of so-called "social senior tourists" living in the national silver economy. This means that Hungary is already a popular destination, where elderly people are willing to habitually spend their income received from another country.

Taking into account the characteristics and niches of the tourism sectors of Hungary, the most significant growth is expected in medical and health tourism among senior visitors. Health tourism has now become a constantly developing tourism product with a great innovation potential. The main attractions of the product are health improvement and general well-being (MICHALKÓ, 2012). Because the market of the product offers services both for healthy consumers and those willing to be healthier, the terms "wellness", "prevention", "therapy", "rehabilitation" and "fitness" have become widespread and common expressions among the

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whole population. Regardless of this phenomenon, the two sub-sectors of health tourism still operate unchanged. Medical tourism offers curative services, while wellness tourism attracts visitors who wish to sustain their healthy condition and well-being. In case of senior tourists, both sub-sectors can provide beneficial services to sustain good health and prevent diseases. It is a special Hungarian feature that – to some extent - both sub-sectors of health tourism are connected to the excellent and easily accessible thermal waters. When examining international trends, it is clear that in other countries, these sub-sectors are connected to different factors, both in terms of service providers and consumers.

The newest wellness trends of health tourism do not require on-site thermal water resources, because thanks to modern industrial technologies, the water does not leave the external operational site and the whole water capacity is recycled, in line with the requirements of sustainability. In the frameworks of international health services, the greatest income of spas does not come from entrance fees, but from related services like plastic surgery, cardiovascular health services, ophthalmology, fertility therapies and dental services that can also be obtained separately. Future innovation and development objectives have far overcome the possibilities of today's health tourism offers; regional services like surrogate mother programmes in India, or genetic therapies in Russia and China are already advertised as health/medical tourism services. These segments raise serious questions about general and medical ethics and initiate sincere professional debates.

2. Conclusion

My research focused one of the most exciting phenomena of today: the ageing of western civilisation and its complex effects on tourism. I have analysed the significance of the silver economy, examined its effects, and as a result it was clarified that it has an impact on almost the whole economy. During the "greying century", the Living Lab experimental programmes were started in the European Union, implementing complex developments and exemplary models focusing solutions in connection with the ageing process. Finland plays a leading role in the experimental research, but the planning process of Park Royal Resorts in Parádsasvár, Hungary had also been finished, opening the way for the practice-oriented implementation of silver tourism innovation. Marketing experts did not use to consider senior people as a significant market factor; moreover, the group was identified as a homogenous segment. Our research results have shown that based on numerous variants, instead of one large homogenous group, senior people should be divided into various heterogonous groups. Thanks to new scientific fields like gerontology, our knowledge on the process of ageing and its principles is constantly increasing. These results are extremely important for silver tourism professionals because the new findings can prepare them for the upcoming challenges of the market. The market of senior tourists represents a key economic segment that has general characteristics from many aspects. Today's tourism destinations are not prepared to receive elderly visitors. First, settlement marketing experts should realise the importance of implementing senior-friendly developments. Through tourism, the whole society can benefit from such improvements, and thus, the purpose of general "well-being" will be served. The tourism sector has the potential to strengthen its sectors through development, and the innovation of existing capacities will instantly be able to serve the demands of silver tourism. Based on its characteristics, Hungary can become a regional destination country, especially in the fields of medical and health tourism. Taking into account the existing medical capacities and international trends, further specialisation towards the needs of the elderly will be required in order to keep the country's competitiveness. As for the possible future trends of silver tourism, I think that the most successful senior tourism products will be those complex

developments that require longer length of stay and consist of health tourism services combined with innovative packages of nursing care and monitoring services.

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Rural society in placemarketing – methodological aspects

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Abstract
The aim of a paper is to evaluate, which placemarketing activities should be proceeded in rural areas where there are very few attractions for outer place-buyers according to rural society opinions. According to a definition placemarketing is designing a place to satisfy different needs, especially those declared by the inhabitants, entrepreneurs, visitors and investors (Kotler, Asplund, Rein and Haider 1999, p. 125). The paper contains methodology of rural society research (local entrepreneurs and inhabitants of Konin region) on local authorities activities for territorial units of different multifunctional rural development level. Among soft factors rural development soft ones become as significant as the infrastructural ones. The paper is finished with preferences of main place-buyers regarding marketing tools.

Key words*:place-marketing, inner integration, rural areas, territorial units, residents needs, enterprises needs, investor needs, rural society behavior*

JEL Classification: *R11, R58, M38, O18*

Introduction

There is a difference between using an idea of place-marketing in rural areas than in cities or regions. In cities and regions organizational and marketing effort is concentrated on attracting outer place-buyers, esp. tourists and investors (Olins 2004, p. 156-158). Residents or local businesses as inner place-buyers are often treated as resources (mainly as labour or suppliers market) for outer ones, composing the basis of place-branding, practically dedicated as idea to cities or regions. Focusing on branding idea in case of towns may cause problems with allocating funds and other resources on low effective activities. The aim of a paper is to evaluate, which placemarketing activities should be proceeded in rural areas where there are very few attractions for outer place-buyers according to rural society opinions. Commune needs were

Definition of placemarketing

Designing a place to satisfy different needs, especially those declared by the inhabitants, entrepreneurs, visitors and investors constitutes one of the placemarketing definitions[1]. City could be a place, as could be an area in the city, rural area, region, country, group of countries (for example UE) or even continent. Main placemarketers are self-government representatives. Moreover other local, regional and national actors are responsible for performing placemarketing tasks.

Main placemarketing goal is to satisfy different needs, but there are also its dimensions focusing on competitiveness of places[2]. Using the idea of placemarketing one should consider

[2] Compare: Szromnik A. (2002), *Marketing terytorialny – koncepcja ogólna i doświadczenia praktyczne* [in:] *Marketing terytorialny*, (ed.) T. Markowski, PAN KPZK, Warszawa, p. 40.

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both goals. Problems described in this paper relate to the first goal. Competitiveness usually means rivalry (Budner, 2004, p. 46). But territorial competitiveness could be divided into direct and indirect one (Markowski, 1996). Indirect competitiveness means creating conditions of regional environment for individuals, enterprises and other organisations. In other words, it is creating possibilities of competing for domestic economic entities[3]. In that case place is treated as a sum of many areas (territorial products). Direct competitiveness means rivalry of territorial units for different benefits. Place is treated as one product offered to external place-buyers (mainly investors and tourists). For regions or other large territorial units direct competitiveness becomes more important goal than for communes, which prefer indirect one treated as a way of improving level of government proficiency what leads to higher effectiveness (improving local statistics) (Komorowski, 2000). Indirect competitiveness means also partnership of territorial units for common benefits with the use of democracy procedures (Prawelska-Skrzypek, 1997, p. 85).

Methodology of rural society research

This paper is based on a premise that designing rural areas begins with asking domestic place-buyers, how to satisfy their needs, because it helps improving local statistics in comparison with other communes. Secondly, empirical verification of theoretical reflection bases on field research conducted in each rural commune of Konin region (former Konin voivodship in Poland) in 2005. This part of present Wielkopolska voivodship has been classified as peripheral area with no specific territorial values (Wysocki, Łuczak, 2002, p. 503). The region has been dominated by backward agriculture and some mining and energy industry (based on brown coal/lignite) highly determining the employment structure. It is difficult to undertake a non-agricultural activity in the region, however it is internally differentiated. Research findings can be generalized for areas, which characterise inner differentiation and similar social-economic situation, such as backward agriculture and industry, but also some opportunities like adjacency of the A2 motorway (Berlin – Poznań – Warsaw – Moscow) and possibilities of alternative energy development (mainly geothermal energy and biomass). Konin region has been chosen, as it indicates the potential to provide an answer to a still current question about what can be done in multifunctional rural development of unattractive areas.

Thirdly, it is set that each rural commune of Konin region should be classified to one of five types according to the level of multifunctional development[4]. Multifunctional rural development (MRD) means modification of the rural employment structure, which is related not only to farmers, but to the whole rural population as well (Kłodziński, 1997, p. 41; Zarębski, 2002, p. 6). This type of development (Duczkowska-Małysz, Małysz, 1994, p. 35)[5] seems to be the most appropriate for Polish rural areas, because it helps to stimulate the entrepreneurship of local actors and allows to avoide vast state intervention in market mechanism (price intervention)[6].

[3] Compare: Porter M. E. (1990), *The Competitive Advantage of Nations*, MacMillan, London, p. 30, 71.

[4] To avoid long sentences the meaning of "very high level of multifunctional development communes" will be changed into "rich communes"; the meaning of "very low level of multifunctional development communes" will be changed into "poor communes".

[5] The other types of rural development are: modernization of agriculture and eco-development

[6] Self-government should be responsible for developing technical infrastructure, systems of environment protection (ecological production) and creating modern labour market able to adapt to challenges of knowledge based economy. Furthermore integration of local society is needed to execute the MRD process, which should be stimulated by all kinds of government.

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The classification became the basis for opinion poll research involving proportionally selected population of 621 inhabitants (that are not entrepreneurs) and 150 entrepreneurs of the region[7]. Each respondent was asked to estimate his/her satisfaction from 33 marketing factors (tools). Subjective grades of placemarketing tools correspond with emotional reasons for starting business activity, which is the basis of the MRD. In fact subjective grades help with measuring the level of satisfaction and influence (importance) of each factor (place-marketing tool) in the local development.

Placemarketing in early definitions was directed to external place-buyers, especially tourists and investors. In that case the most important goal for a territorial unit is to differentiate the local offer in comparison with other ones. Moreover, basic placemarketing task is to create a plain system of identification (place branding)(Olins, 2004, p. 147 – 166)[8]. But if investors decide to invest in the place, they change their status into local entrepreneurs (or local division of transnational corporation). In that case the system of identification matters less for investors and localisation acceptance is a function of investment climate and commune facilities.

Attracting investors to a place can be short-time effect, but keeping them in long run depends on conditions and regulations offered to local enterprises. Local opinions about local infrastructure elements and the level of other placemarketing activities could be important measure for local authorities helping to decide what should be the frames of local development politics.

Commune needs of rural entrepreneurs and inhabitants

The study presented in the paper focuses on comparative analysis of inhabitants and local entrepreneurs' preferences. Local authorities willing to increase the level of commune competitiveness (indirect meaning) should recognise main local preferences, especially in rural areas, because strong local economy is not only needed for local society, but also attractive for exterior place-buyers (table I).

Table I. Commune needs declared by entrepreneurs in different rural areas of the Konin region

Commune needs	Level of multifunctional rural development					Total
	Very low	Low	Medium	High	Very high	
Tax reductions, financial support	9,89%	11,32%	14,89%	10,34%	18,73%	13,43%
New workplace endowments, SME support	14,45%	20,75%	25,53%	24,56%	15,45%	21,76%
Commune safety	5,43%	15,09%	10,64%	3,46%	7,73%	10,50%
Information of commune auctions and investments	1,34%	3,77%	2,13%	7,14%	4,78%	3,18%
Investment climate, competence of civil servants, easy procedures	8,56%	1,12%	8,51%	27,87%	8,33%	7,80%

[7] Each group was treated as a different sample; there is a principle, that the most homogenic population should be sampled in primary studies to research better differentiation.

[8] Place branding , in the author's opinion should be used to attract tourism, foreign (and domestic) direct investments and support exports; that approach would be in fact not useful in rural areas.

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(except freehold gaining), "do not disturb"						
External investors gaining	19,22%	11,32%	14,89%	7,14%	11,34%	13,36%
Technical infrastructure improvements	4,52%	5,66%	4,26%	3,23%	3,11%	4,48%
Easy procedures of freehold gaining	19,87%	10,21%	4,26%	1,98%	19,87%	9,23%
Consulting (esp. EU funds), partnership	7,20%	7,55%	1,44%	7,14%	8,32%	5,00%
Local enterprises promotion	9,52%	13,21%	13,45%	7,14%	2,34%	11,24%

Source: own elaboration on empirical research

Main commune needs for entrepreneurs are new workplace endowments and SME support. The hierarchy of commune needs confirms demand for MRD support. The need is the most important for entrepreneurs of almost every commune type except the most developed ones. Entrepreneurs functioning in rich communes are primarily interested in easy procedures of freehold gaining, tax reductions and financial support.

Wealth broadening is a determinant of the last stages of economic growth (Rostow, 1960; Grant, 1991, p. 540) and empirically proves that MRD is a way of implementing rules of market economy in the rural areas. Gaining freehold is very important for entrepreneurs in very poor communes as well. It can be presumed that Polish entrepreneurs of rich communes treat freehold as a basis for investment, while Entrepreneurs in poor ones regard freehold as a traditional factor of functioning.

The second most important commune needs declared by entrepreneurs are tax reductions, financial support and gaining external investors (35% total indications). In marketing literature the needs are called economic (cost or price) ones. Promotion of local enterprises is much more important for entrepreneurs than improving technical infrastructure or delivering the information about commune auctions and investments.

The needs may be estimated by using questions about information that should be available on communes' internet websites**.** Almost 22% polled entrepreneurs were not able to answer the question[9] (Table II.), what could be related to 24,3% of entrepreneurs declaring no access to internet (Fig. 1.).

[9] The question about information that should be available on communes' websites was asked regardless of weather or not the entrepreneur has visited the websites.

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Fig. 1. Access to internet declared by entrepreneurs and inhabitants of Konin rural areas

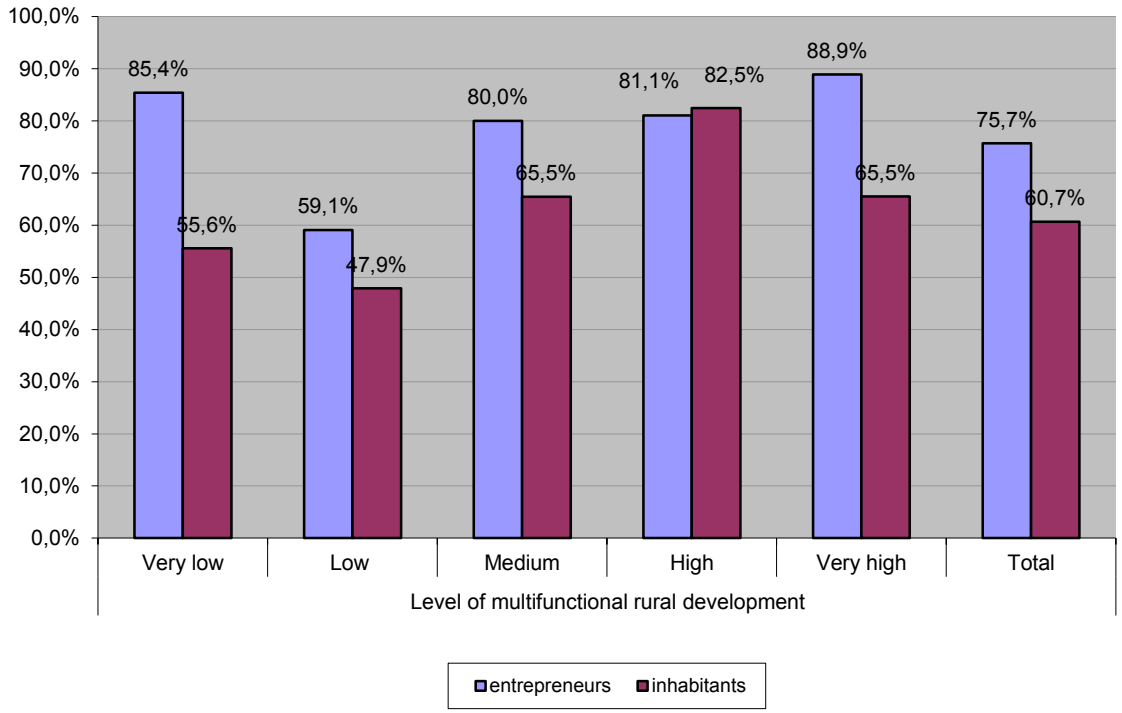

Table II. Type of internet information preferred by entrepreneurs

Type of internet information	Level of multifunctional rural development					Total
	Very low	Low	Medium	High	Very high	
Standard news, local legal rulings, regulation changes (esp. tax rates)	26,78%	28,56%	37,04%	16,38%	23,08%	30,42%
Economic news, information about and for local enterprises, local products and enterprises advertising	14,67%	12,50%	7,41%	15,82%	11,62%	10,74%
Cultural, tourist and entertainment information	3,29%	5,36%	3,70%	6,67%	2,12%	4,17%
Auctions, investment plans, real estate offers	22,74%	7,14%	14,81%	24,12%	15,38%	14,20%
Spatial planning, local strategies and plans	7,65%	5,36%	3,70%	15,78%	7,69%	5,94%
General statistics, commune maps	1,45%	3,57%	0,00%	0,00%	0,00%	1,18%

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Forms, documents, working hours, structure of the office, telephones	2,93%	3,57%	1,85%	6,67%	2,54%	2,89%
Information about trainings, consulting, financial support	15,67%	6,42%	7,42%	7,89%	4,57%	7,72%
Prices and cost of products and services	0,75%	0,00%	0,00%	0,00%	7,69%	0,95%
No answer	4,07%	27,52%	24,07%	6,67%	25,31%	21,79%

Source: own elaboration based on empirical research

Entrepreneurs of almost every commune type prefer standard news (especially local legal rulings and regulations) and information about auctions, investment plans or real estate offer (respectively 30,42% and 14,20%). Before conducting the study, it had been presumed that more detailed information should have been wanted in rich communes. But entrepreneurs in poor communes are interested in using both general and detailed internet information (such as trainings, consulting, economic news etc.). Entrepreneurs seem to be rural avant-garde, especially in communes of very low level of MRD, and local authorities should begin strategic planning together with economic entities. Defining local needs and sources of information is a first step in describing detailed opinions on placemarketing tools (Table III.).

Table III. Grades of placemarketing tools declared by entrepreneurs

Placemarketing tools	Level of multifunctional rural development											
	Very low		Low		Medium		High		Very high		Total	
	C	I	C	I	C	I	C	I	C	I	C	I
Technical infrastructure	**2,57**	**4,34**	**3,33**	**3,90**	**3,20**	**4,09**	**3,39**	**4,08**	**3,37**	**2,83**	**3,26**	**3,94**
Motorways network	2,51	4,49	3,12	3,91	2,51	4,17	2,67	3,56	2,78	3,17	2,80	3,94
Telecommunication network	2,75	4,64	3,70	4,09	3,59	3,97	3,56	4,33	3,33	2,33	3,58	3,98
Gas and electricity facilities	3,25	3,98	4,05	4,32	3,85	4,23	3,78	4,11	4,00	2,83	3,91	4,06
Internet access	1,75	4,25	2,46	3,29	2,84	4,00	3,56	4,33	3,38	3,00	2,74	3,78
Business environment	**2,78**	**3,78**	**2,73**	**3,67**	**2,97**	**3,79**	**2,89**	**3,52**	**2,62**	**2,66**	**2,82**	**3,62**
Consulting and training centres	1,75	3,38	1,49	2,94	2,84	3,13	2,65	3,35	1,12	1,82	2,08	2,97
Administration	**2,54**	**3,99**	**2,85**	**3,79**	**2,80**	**4,24**	**2,67**	**3,25**	**2,65**	**2,71**	**2,79**	**3,84**
Clerk honesty	2,75	4,25	3,17	4,06	2,94	4,29	2,67	3,22	3,11	2,67	3,02	3,97
Clerk favour	2,67	3,93	3,19	3,97	2,95	4,13	2,78	3,00	3,11	3,00	3,05	3,86
Operational readiness to help	2,25	3,86	2,98	3,89	2,97	4,23	2,67	3,00	2,89	3,17	2,91	3,88
Competence	2,76	4,02	2,95	3,89	2,79	4,26	3,11	3,11	2,57	2,67	2,88	3,87

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Efficiency of administrative affairs		2,25	4,05	2,74	3,89	2,65	4,31	2,56	3,33	2,29	2,50	2,64	3,92
Capacity to enter relations with external investors		2,47	3,78	2,40	3,37	2,60	4,17	2,44	3,44	2,14	2,33	2,46	3,63
Capacity to enter relations with local enterprises		2,62	4,01	2,52	3,49	2,67	4,29	2,44	3,67	2,43	2,67	2,56	3,76
Social infrastructure		**2,41**	**3,84**	**2,53**	**3,38**	**2,67**	**3,76**	**2,84**	**3,33**	**2,95**	**2,79**	**2,64**	**3,48**
Labour market	Workers	3,52	4,12	3,36	3,74	3,11	4,17	3,11	3,67	3,71	2,50	3,28	3,81
	Managers	2,34	4,25	3,10	3,57	3,14	4,21	2,67	3,44	3,71	2,83	3,12	3,76
Labour market organisations		2,21	3,50	1,67	3,06	2,32	3,39	2,67	3,56	1,56	2,00	1,99	3,17
Tourism infrastructure		1,75	4,11	2,18	3,38	2,30	3,50	3,00	3,11	2,89	3,83	2,35	3,46
Cultural infrastructure		2,25	3,23	2,33	3,15	2,48	3,54	2,78	2,89	2,89	3.24	2,48	3,23
Other marketing activities		**2,54**	**3,91**	**2,54**	**3,72**	**2,72**	**3,89**	**2,76**	**3,80**	**2,63**	**4,21**	**2,63**	**3,86**
Spatial planning		2,66	4,04	2,63	3,74	2,66	3,96	3,00	3,38	2,71	4.23	2,69	3,82
Commune site		3,03	3,97	3,20	3,97	3,76	4,32	3,33	3,94	3,86	3,97	3,43	4,14
Costs of functioning in commune		3,21	3,77	2,71	3,56	3,03	3,64	3,11	4,13	2,29	4,43	2,84	3,70
Inhabitants mentality		2,25	4,03	2,66	3,66	2,79	3,54	2,67	3,88	2,71	4,45	2,69	3,72
Commune promotion		2,43	3,97	2,24	3,63	2,27	4,00	2,78	3,50	2,33	3,87	2,30	3,79
Inclusion of inhabitants and entrepreneurs in a decision-making process		1,65	3,67	1,78	3,76	1,83	3,85	1,67	3,98	1,88	4,32	1,82	4,02
Total Average		**2,49**	**3,96**	**2,72**	**3,67**	**2,83**	**3,96**	**2,86**	**3,56**	**2,76**	**3,05**	**2,77**	**3,74**

Attention: „C" – the condition of tool means the level of satisfaction of commune element or activity; "I" – the influence of tool means subjectively graded level of tool importance in MRD; 5-point scale was used.

Source: own elaboration on empirical research

Local authorities could compare grades of each tool (infrastructure element or activity) declared by entrepreneurs, inhabitants or other important place-buyer to decide which tool should be primarily improved. Decisions may be made according to the "condition" grades (low value suggests urgent action) or "importance" grades (high value suggests urgent action). The third premise of a decision-making process could be comparison of both grades for each tool[10].

Three placemarketing tools achieved very high grades of importance in MRD: commune site, gas and electricity network and inclusion of inhabitants and entrepreneurs in a decision-making process. The condition of last tool, which is treated as an vital effectual partnership activity,

[10] While comparing the grades one could use a subtraction or a quotient; those measures have been described in Romanowski R. (2006), *Role of Placemarketing in Multifunctional Rural Development,* http://www.paisley.ac.uk/business/cces/documents/RobertRomanowski.doc

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was graded at the lowest level of all presented tools[11]. This suggests that partnership activities are not satisfactory (especially for entrepreneurs of rich communes).

Entrepreneurs declare the importance of technical infrastructure as well as administration features (especially clerk honesty and operational readiness to help). Soft factors become as significant determinant of rural development as infrastructural ones. Those traditional development factors are treated by entrepreneurs of rich communes as secondary, while partnership, entrepreneurial mentality of inhabitants or costs of functioning are basic for MRD. Even commune promotion is graded higher than technical infrastructure. This observation strengthens the thesis that in rich communes soft factors are more significant than infrastructural ones.

Localisation, technical infrastructure and administration features are treated as important in MRD, but their condition grades are high as well. This idicates that important needs are rewardingly satisfied. The worst satisfied entrepreneurs' need is partnership (inclusion in the decision-making process)[12].

Entrepreneurs and inhabitants are different target markets for placemarketers. Both groups have been discussed separately, but in a way that enables the comparison. Polish law treats inhabitants as commune[13]. Local authorities (self-government) act on their behalf and for them. Inhabitants should be in that case regarded as a main placemarketing target market.

Authorities of rural areas ought to decide which target group gives chance to gain higher level of commune multifunctionality. Inhabitants are mainly beneficiaries of MRD, because they could be employed by newly-created enterprises or farmers changing their production profile. Identifying inhabitants' needs is necessary to support MRD (Table IV.).

Table IV. Commune needs declared by inhabitants in different rural areas of the Konin region

Commune needs	Level of multifunctional rural development					Total
	Very low	Low	Medium	High	Very high	
Financial and social support (tax reductions, lower regular payments – hire, heating, etc.)	2,78%	8,33%	9,90%	0,00%	4,88%	7,36%
Labour market support (esp. unemployment reduction)	33,33%	22,44%	27,72%	16,67%	17,07%	24,34 %
Commune safety, order and clean keeping etc.	8,33%	5,13%	6,93%	7,41%	17,07%	7,36%
Culture and tourism development (events, better bike ways)	5,56%	8,97%	3,47%	11,11%	2,44%	6,13%

[11] Lower grades were given to airport and railway network, because it does not exist in the area under study; these tools were omitted in further research.

[12] Asked about integration activities none of the entrepreneurs pointed out even one; entrepreneurs think that they have no impact on decision-making process; unfortunately traditional conflict "we – they" (inhabitants and entrepreneurs vs. authorities) still persist .

[13] Legal basis: *Ustawa o samorządzie terytorialnym* z dnia 8 marca 1990 (Dz. U. z 1996 r. Nr 13, poz. 74, art. 1, ust. 1); Commune is defined as a self-government society or a territory, where the society live.

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Clerk competence and honesty	19,44%	25,64%	14,36%	27,78%	7,32%	19,22 %
Investor gaining, local entrepreneurs support	5,56%	10,26%	18,32%	18,52%	2,44%	13,50 %
Technical infrastructure improvements (esp. motorways)	19,44%	10,90%	12,38%	12,96%	29,27%	13,91 %
Commune communication network improvements	2,78%	0,64%	0,50%	0,00%	7,32%	1,23%
Social infrastructure improvements (education, health)	0,00%	5,77%	4,95%	3,70%	7,32%	4,91%
Local enterprises promotion	2,78%	1,92%	1,49%	1,85%	4,88%	2,04%

Source: own elaboration on empirical research

The main commune need declared by inhabitants is labour market support what is classified to be the basic problem of MRD. Inhabitants of rich communes demand technical infrastructure improvements and commune safety, order and clean keeping. Administration features are not as important as in other commune types. Financial and social support seems to be secondary commune need. This indicates that Polish rural inhabitants, though influenced by communist past, do not declare claimant attitude and prefer improvements in the entrepreneurial climate.

The needs of labour market support are verified by opinions on information that should be available on commune internet websites (Table V.).

Table V. Type of internet information preferred by inhabitants

Type of internet information	Level of multifunctional rural development					Total
	Very low	Low	Medium	High	Very high	
Standard news, local legal rulings, regulation changes (esp. tax rates)	18,18%	33,98%	26,92%	34,38%	40,00%	29,88%
Economic news, information about and for local enterprises, local products advertising	4,55%	4,85%	9,62%	0,00%	0,00%	6,40%
Cultural, tourist and entertainment information	18,18%	13,59%	11,54%	21,88%	6,67%	13,41%
Auctions, investment plans, real estate offers	9,09%	6,80%	16,67%	15,63%	6,67%	12,50%
Spatial planning, local strategies and plans	9,09%	7,77%	8,33%	12,50%	20,00%	9,15%
General statistics, commune maps	9,09%	10,68%	3,85%	3,13%	6,67%	6,40%
Forms, documents, working hours, structure of the office, telephones	0,00%	2,91%	2,56%	6,25%	0,00%	2,74%

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Information about trainings, consulting and job offers	31,82%	12,62%	16,67%	6,25%	13,33%	15,24%
Want ads, prices and cost of products and services	0,00%	6,80%	3,85%	0,00%	6,67%	4,27%
No answer	40,74%	44,63%	23,74%	37,50%	51,72%	35,96%

Source: own elaboration on empirical research

At first, rural inhabitants look for standard news and local law changes, especially in rich communes. Second important need is the information about trainings, consulting, job offers and also cultural, tourist and entertainment information. First need for entrepreneurs and inhabitants is the same, but the second one differs. Economic entities think of investments, while inhabitants – about spare time.

Job offers are very important for inhabitants of poor communes, but they visit internet websites occasionally (Fig. 1.). Rural authorities should consider personal contacts (formal and informal) to support positive processes (MRD, unemployment reduction, etc.). Furthermore, inhabitants appreciate capacity to enter relations with domestic enterprises and external investors (Table VI.).

The technical infrastructure is graded on the similar level by inhabitants and entrepreneurs. The most urgent action should be undertaken to improve motorways network and internet access (the widest gap between condition and importance grades).

Inhabitants give lower condition grades to business environment, but higher importance grades than entrepreneurs. If authorities want to develop professional services (such as consulting and training centres or other business facilities), it will indicate competitive niche thinking attitude (Kotler, Asplund, Rein and Haider 1999, p. 104)[14], the highest level of strategic market planning.

The widest gap between condition and importance grades appeared in inclusion of the inhabitants and entrepreneurs in the decision-making process. The highest condition grades were given to gas and electricity facilities and they are higher then importance grades. That infrastructure element satisfied inhabitants' needs better than it had been expected. All elements of technical infrastructure achieved best condition grades as a group, but the most important group of placemarketing tools are elements of business environment.

Table VI. Grades of placemarketing tools declared by inhabitants

Placemarketing tools	Level of multifunctional rural development											
	Very low		Low		Medium		High		Very high		Total	
	C	I	C	I	C	I	C	I	C	I	C	I
Technical infrastructure	**3,01**	**4,01**	**3,14**	**3,51**	**3,19**	**3,90**	**2,99**	**3,71**	**3,45**	**3,94**	**3,17**	**3,67**
Motorways network	2,33	3,71	3,13	3,76	2,77	3,84	2,55	3,66	3,11	4,00	2,74	3,69
Telecommunication network	3,67	4,43	3,76	3,81	3,81	4,03	3,28	3,79	3,96	4,06	3,71	3,83
Gas and electricity facilities	3,81	4,25	3,83	3,69	4,07	4,11	3,70	3,66	3,82	4,00	3,85	3,80
Internet access	2,25	3,67	1,83	2,77	2,11	3,60	2,43	3,75	2,93	3,69	2,36	3,36

[14] Main goal of competitive niche thinking is preparing local community for the challenges of knowledge based (and driven) economy.

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Business environment	**2,78**	**3,67**	**1,78**	**2,65**	**2,26**	**3,51**	**2,28**	**3,59**	**2,00**	**3,50**	**2,71**	**3,72**
Consulting and training centres	3,07	3,86	3,44	3,92	3,49	4,21	3,15	3,81	3,52	4,30	2,79	3,77
Administration	**2,59**	**3,69**	**2,81**	**3,37**	**2,93**	**3,98**	**2,43**	**3,70**	**2,54**	**3,65**	**2,88**	**3,64**
Clerk honesty	2,69	3,70	2,93	3,57	3,03	3,99	2,50	3,81	2,33	3,85	2,66	3,68
Clerk favour	2,77	3,35	3,05	3,37	3,07	3,84	2,65	3,73	2,93	3,62	2,95	3,75
Operational readiness to help	2,54	3,75	2,82	3,41	2,90	3,95	2,35	3,64	2,56	3,75	2,54	3,69
Competence	2,81	3,90	3,08	3,54	3,13	3,96	2,68	3,67	2,85	3,75	2,58	3,74
Efficiency of administrative affairs	2,48	3,90	2,80	3,41	2,69	3,97	2,30	3,69	2,48	3,75	2,60	3,75
Capacity to enter relations with external investors	2,42	3,60	2,48	3,13	2,81	4,08	2,30	3,73	2,37	3,42	2,60	3,50
Capacity to enter relations with domestic enterprises	2,39	3,65	2,54	3,16	2,86	4,07	2,20	3,63	2,26	3,42	3,19	3,63
Social infrastructure	**2,80**	**3,78**	**2,42**	**3,18**	**2,65**	**3,67**	**2,70**	**3,68**	**2,69**	**3,76**	**2,90**	**3,71**
Labour market - workers	2,96	4,00	3,09	3,44	3,24	3,77	3,45	3,93	3,00	4,22	2,30	3,54
Labour market - managers	2,85	3,86	2,78	3,41	2,98	3,90	2,98	3,76	3,04	3,73	2,19	3,28
Labour market organisations	2,73	3,53	2,03	3,07	2,41	3,86	2,05	3,62	2,31	3,56	3,40	4,04
Tourism infrastructure	2,69	3,95	1,94	2,96	2,20	3,44	2,93	3,68	2,27	3,70	2,23	3,34
Cultural infrastructure	2,74	3,57	2,28	3,04	2,39	3,39	2,08	3,43	2,85	3,60	2,38	3,29
Other marketing activities	**2,87**	**3,65**	**2,58**	**3,29**	**2,87**	**3,62**	**2,55**	**3,56**	**2,47**	**3,65**	**2,76**	**3,53**
Spatial planning	3,04	3,40	2,69	3,31	2,94	3,53	2,56	3,61	2,65	3,80	2,89	3,44
Commune site	3,35	4,10	3,52	3,85	3,49	4,04	3,33	3,77	3,52	4,10	3,56	3,91
Costs of functioning in commune	2,73	3,55	2,59	3,18	3,04	3,75	2,95	3,42	2,32	3,25	2,85	3,55
Inhabitants mentality	3,00	3,75	2,79	3,21	2,78	3,37	2,51	3,46	2,23	3,50	2,73	3,38
Commune promotion	2,85	3,65	2,23	3,36	2,71	3,62	2,20	3,50	2,31	3,75	2,57	3,56
Including/Inclusion of inhabitants and entrepreneurs in a decision-making process	2,24	3,47	1,64	2,80	2,25	3,44	1,74	3,58	1,76	3,50	1,98	3,32
Average for type of commune	**2,80**	**3,76**	**2,71**	**3,32**	**2,89**	**3,80**	**2,63**	**3,66**	**2,72**	**3,74**	**2,78**	**3,61**

Attention: „C" – the condition of tool means the level of satisfaction of commune element or activity; "I" – the influence of tool means subjectively graded level of tool importance in MRD;

Source: own elaboration on empirical research

Administration obtains better grades of condition and importance in entrepreneurs' opinions (they are more sensitive to investment climate). Inhabitants treat clerk favour, operational

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readiness to help and competence as pretty important in MRD process. Social infrastructure impacts rural development intensely in inhabitants' opinions[15].

Conclusions

Entrepreneurs treat partnership as a key development factor (except commune site and gas and electricity facilities), but neglected by local authorities. Localisation is a key development factor for inhabitants (Table VII.).

Table VII. Preferences of main place-buyers regarding marketing tools

Marketing tools	External investors	Tourists	Domestic economic entities	Inhabitants
Main commune needs	Investment climate	Attractive environment	New workplace endowments, SME support	Unemployment reduction, recruitment support
Promotion, sources of commune information	Average; press; export promotion support	Average – internet and friends or family opinion	Average – economical gossip ("word of mouth")	Average – "word of mouth" information
Product	Very important – business environment	Key, especially attractive environment	Very important for entrepreneurs, important for farmers	Very important (esp. education)
Localisation	Very important – esp. cost localisation	Availability – very important, spatial planning – important	Very important; for entrepreneurs – cost localisation, for farmers – land affection (local patriotism)	Key – land affection could be weakened by severe financial situation
Costs	Very important	Average	Entrepreneurs – Very important (taxes), farmers – Average (regular payments)	Important; regular payments (hire, heating)
Partnership	Very important	Very important	Key	Average
People	Self-government activities – important; workers – key success factor	Self-government activities – important; kind service – very important	Self-government activities – Very important; mentality – important (entrepreneurs) or unimportant (farmers)	Self-government activities – important; mentality – average

[15] The best notes were given by inhabitants to education system, but it was not mentioned in Table VI.; it shows good background to implement MRD; almost 30% of respondents (adults) declared knowledge of at least one foreign language (mainly English) and 64% of inhabitants declared at least average level of basic IT skills.

Attention: scale – key (the most important), very important, important, average, unimportant

Source: own elaboration on empirical research

Inhabitants declare the need of labour market support as well as entrepreneurs wanting new workplace endowments. Multifunctional rural development as a chance to improve competitiveness of rural communes should begin with local entrepreneurs, because they are more responsive to self-government's marketing activities (high importance notes of all placemarketing tools, high sensitiveness about local integration). Besides, entrepreneurs know their local environment much better than inhabitants or even farmers. Local actors consider soft factors as more important in development than technical infrastructure.

Rural communes of the Konin region represent model of development in which communes of very low level of MRD should improve technical infrastructure (necessary, but not sufficient requirement of development). Simultaneously the communes of very high level of MRD should increase level of soft factors, such as partnership or investment climate. At the beginning of MRD process financial support is needed, although treated as investment, and not as long-lasting intervention. Local entrepreneurs should become leaders of the transition, helping to increase the level of indirect (and even direct) competitiveness. Could inhabitants and entrepreneurs really help in designing rural areas? They not only could but should. They are simultaneously place-marketers (help designing the place) and place-buyers (designed place's offer satisfies their needs).

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SESSION 8

Agricultural university education, quality assurance and humanity studies – organized session by the *PACAgro tempus project*

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Butter safety in terms of traceability

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Abstract
In the process of production and subsequent storage butter can get antibiotics, salts of heavy metals, radionuclides, pesticides, as well as microorganisms that damage the quality of the finished product may develop and have a harmful impact on human health. The traceability system allows to detect the safety performance at all stages of butter production and its further storage. The safety performance changes of the consumption of animal feeding stuff, producing raw milk and cream for butter production, obtaining butter and its storage were discovered. It was found that the toxic elements, radionuclides, microorganisms are the most susceptible to changes in terms of traceability in the process of butter production.

Keywords: *butter, safety, traceability system*

JEL Classification: *Q11, Q18*

Introduction

Nowadays one of the major problems is the safety of dairy products. Butter is a traditional product that a person regularly uses in the diet. It mainly consists of milk fat and milk plasma. Its structure also contains proteins, carbohydrates, vitamins A, D, β-carotene, and many other biologically valuable micronutrients. Butter is a high-calorie product with high nutritional and energy value, and has a pleasant flavour. All this makes butter essential for a healthy diet of people of all age groups. [1] At various stages of production and storage of butter it can gain toxic elements, radionuclides, pesticides, antibiotics, microorganisms and other hazardous substances [8, 14, 15]. To prevent negativeinfluence on human health, it is necessary to investigate the safety indices in the traceability system [8, 16, 17]. To guarantee the production of high quality product, traceability is an important principle that is compatible with the technical regulations and the accuracy of their fulfillment [10].

The aim of our study was to investigate changes in safety performance throughout the entire production starting from the animal consumption of feeding stuff to milk, cream and butterproduction.

Target and methods of research

The samples of feed stuff for cattle were selected on the basis of agricultural business according to the sampling standards, as this food is constantly used for feedinganimals . The samples of raw milk, cream and butter were taken from the processing plant located on the territory of the same venture. The butter "Krest'anskoye (Peasant's)" with a fat mass portion of 72.5%was investigated. Raw milk was selected after being delivered to the processing plant. Cream was selected in the course of itsprocessing before churning the butter, while the latterwas immediately sampled after production. The studies were conductedaccording to a three-stage pattern on the basis of specialized, certified laboratory, so there is no doubt in the reliability of the results. The test reports were prepared during the study. The butter was put in

the cooling chamber at a temperature of 3 ± 2 ° C to study the changes of microbial indicators in butter within the whole shelf life (20 days).

To determine the content of mycotoxins (aflatoxins M1) thin -layer chromatographic methodwas used. The method is based on the extraction of aflatoxin M1 product samples, its cleaning , measuring the mass concentration by thin-layer chromatography [4] .To determine the residual amounts of organochlorine pesticides thin layer chromatography was also used. The method is based on isolating organochlorine pesticides from milk and milk products, purifyingthe extracts and placing them on glass plates coated with a layer of adsorbent. Then rectification of chromatogram in the mobile solvent was made and the development of the chromatogram with silver nitrate was produced [2]. Stripping voltammetry method was used to determine the mass amount of arsenic and mercury. The method is based on the dependence of the current passing through the analyzer cell with the solution being tested on the mass fraction of the element contained in the solution and are functionally associated with the shape and parameters applied to the electrodes of polarizing voltage [19]. Mass proportion of cadmium and lead were determined using the method of stripping voltammetry. The essence of the method is the following: stripping voltammetry method is based on the dependence of the current which is passing through the analyzer cell with the solution being tested on the mass fraction of the element contained in the solution and are functionally associated with the shape and parameters applied to the electrodes of polarizing voltage. Voltammetric analyzers AKV-07 MK were used [20]. The scintillation spectrometer - radiometer of gamma - and beta - radiation ICBG-01 "RADEK" was utilized to determine the radionuclides, cesium-137, strontium-90 [9].

According to technological standards GOST 53430-2009”Milk and dairy products: Methods of microbial analysis” the Quantity of Mesophilic Aerobic and Facultative Anaerobic Microorganisms(QMAFAnM), as well as coliforms were investigated [7]; the total counts of Staphylococcusaureus were made in accordance with GOST 30347-97 “Milk and dairy products: Methods of determining Staphylococcus aureus” [3].

Determination of pathogenic microorganisms, including Salmonella was carried out in accordance with GOST 31659-2012 “Food products. The method of identifying Salmonella bacteria” [5]. Listeria monocytogenes were determined in accordance with GOST 32031-2012 “Food products. Methods for detection of bacteria Listeria monocytogenes” [6]. Yeast and molds count was carried out in accordance with GOST 10444.12-88 “Food products. Methods to determine yeasts and moulds” [2].

The safety assessment was made in compliance with technical regulations of the Customs Union “On Safety of Milk and Dairy Products” (TR TS 033/2013) and technical regulations of the Customs Union “On Safety of Food Products” (TR TS 021/2011) [11, 12].

Findings and discussion

When studying the cattle food stuff, raw milk, cream for butter production and bovine butter the indicators of residual quantities of pesticides, such as hexachlorocyclohexane (HCH) and dichlorodiphenyl-trichloroethane (DDT) and its metabolites, were determined. These pesticides were found in all the tested samples, but their concentration did not exceed the allowable levels. Moreover, it is worth mentioning that their amount has not been changed. They are carried from the cattle feed, through the raw milk into the cream and butter in the same amount [table 1].

Radionuclides were found to be present in all the tested samples, but their concentration did not exceed the allowable level [table 2]. When studying the traceability chain of cesium-137,

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it was found out that its amount in the cattle feed stuff was almost 1.3 times as much as in raw milk [13]. Further the content of cesium-137 increased in the cream used for butter production from the same milk and the butter itself, which is apparently related to the concentration of milk fat [table 2].

Table 1 The study of changes of butter safety indices in the traceability system (pesticides residues)

Index	Cattle feed stuff		Raw milk		Cream for butter production		Bovine butter	
	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result
HCH, mg/kg, max	0,05	> 0,008	0,05	>0,008	1,25	> 0,008	1,25	> 0,008
DDT, mg/kg, max	0,05	>0,005	0,05	> 0,005	1,0	>0,005	1,0	>0,005

Table 2 The study of changes of butter safety indices in the traceability system (radionuclides)

Index	Cattle feed stuff		Raw milk		Cream for butter production		Bovine butter	
	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result
cesium-137, max. Bq/kg; Bq /l	600	> 2,39	100	> 1,89	100	>2,83	200	> 3,17
strontium 90 , max. Bq/kg; Bq /l	65	> 17,23	25	>12,46	25	> 31,55	60	> 36,84

The content of strontium-90 in the samples was also subjected to change [13]. In raw milk strontium content was lower than in the cattle feed, and we can observe its increase in cream and butter [table 2]. No antibiotics such as chloramphenicol, streptomycin, penicillin, and those of tetracycline group were found in raw milk, cream and butter.

The results of the study of toxic elements changes revealed that the lead content was 7 times lower in raw milk, compared with cattle feed [table 3]. The lead content increased twice in cream, compared to milk, and slightly decreased in bovine butter compared to cream [table 3]. Cadmium was found in all the tested samples in the same amounts and do not exceed allowable levels.

On studying the transfer of arsenic and mercury, they were traced in all the examined samples, but their concentration did not exceed the allowable levels [table 3]. Arsenic and mercury are transferred to the raw milk from the cattle feed stuff completely, and further their concentration increases in cream and butter (arsenic). The mercury amount in cream and bovine butter remains the same. Further, the mercury concentration in the cream is on the rise compared to raw milk and get into butter in the same amount [13].

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Mycotoxins have been identified in the traceability system of safety indices. The amount of aflatoxin B1 found in the cattle feed stuff was determined to be less than 0,020 mg/kg, which did not exceed the allowable level which is maximum 0.05 mg/kg. Mycotoxins, in particular patulin and deoxynivalenol, were not revealed. The mycotoxins (aflatoxin M1) count was determined in raw milk, as well as in cream for butter production and bovine butter. It was discovered that the content of aflatoxin M1 made less than 0.0005 mg/kg in the studied samples, which did not exceed allowable level (the acceptable level is not more than 0.0005 mg/kg).

Thus, the content of aflatoxin M1 does not change in the process of its transition from raw milk to cream and further into the butter.

No pathogenic microorganisms such as salmonellae were revealed in all the tested samples in terms of traceability. The maximum allowable level of pathogenic microorganisms, including Salmonella, is not permitted in 50 g of cattle feed stuff ; it should not be exceeded in 25 $cm^3$of raw milk; and it is not allowed in 25 g of cream and bovine butter [12]. The Quantity of Mesophilic Aerobic and Facultative Anaerobic Microorganisms (QMAFAnM) was determined in raw milk, cream for butter production as well as in bovine butter.

As a result, it was determined that QMAFAnM count in raw milk, cream and butter, did not exceed allowable levels [table 4]. The somatic cells count in raw milk did not exceed acceptable levels and accounted for less than $5 \cdot 10^5$ in 1 cm^3 (while the maximum allowable concentration is $7.5 \cdot 10^5$ 1 cm^3).

Table 3 The study of changes of butter safety indices in the traceability system (toxic elements)

Index	Cattle feed stuff		Raw milk		Cream for butter production		Bovine butter	
	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result
Lead, mg/kg, max	5,0	0,0134	0,1	0,0018	0,1	0,0044	0,1	0,0037
Cadmium, mg/kg, max	0,4	>0,020	0,03	>0,020	0,03	> 0,020	0,03	> 0,020
Arsenic, mg/kg, max	1,0	> 0,002	0,05	> 0,002	0,05	0,0032	0,05	0,0048
Mercury, mg/kg, max	0,1	> 0,0001	0,005	> 0,0001	0,005	> 0,0020	0,005	> 0,0020

Escherichia coli group bacteria – CGB (coliforms), Staphylococcus aureus, Listeria monocytogenes were not revealed in the samples of cream for butter production and in bovine butter [table 4]. On studying the butter, it was found out that yeasts and moulds total count amounted to $1 \cdot 10^2$ CFU/g, which did not exceed the acceptable levels.

The change in microbiological characteristics of QMAFAnM, measured in CFU/g, and well as of yeast and moulds total count ,also measured in CFU/g was studied during the storage of butter (net weight of 500 g) packed in grease-proof paper. The research of butter was carried out twice: just after manufacturing and 20 days later (within the shelf-life period). It was discovered that QMAFAnM, yeasts and moulds counts tend to increase in butter during its storage. The content of QMAFAnM grew 88 times at the end of expiration date of butter,

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while that of yeast and moulds rose 140 times compared to the allowable concentration [table 5].

Table 4 The study of changes of butter safety indices in the traceability system (microorganisms)

Index	Raw milk		Cream for butter production		Bovine butter	
	allowable concentration	Result	allowable concentration	Result	allowable concentration	Result
QMAFAnM, CFU/см^3; max.CFU/g	$5\cdot10^5$	$2{,}5\cdot10^5$	$1\cdot10^5$	$6\cdot10^4$	$1\cdot10^5$	$9{,}2\cdot10^4$
CGB (coliforms), not allowed in gr	-	-	0,01	Not found	0,01	Not found
S.aureus, not allowed in gr	-	-	1.0	Not found	1.0	Not found
L.monocytogenes, not allowed in gr	-	-	25	Not found	25	Not found

Table 5 The change in microbiological characteristics during bovine butter storage

Index	Allowable concentration	Butter after production	Butter 20 days later
QMAFAnM, max.CFU/g	$1\cdot10^5$	$9{,}2\cdot10^4$	$8{,}8\cdot10^6$
Yeast and moulds total count, max.CFU/g	$1\cdot10^2$	$1\cdot10^2$	$1{,}4\cdot10^4$

Conclusions

Thus, the changes in safety performance have been established in the system of traceability in the process of butter production. The concentration of radionuclides in bovine butter increases in comparison with the raw material. The concentration of toxic elements, such as lead, arsenic and mercury, increases compared with raw milk, while cadmium count does not change. It is determined that during the storage of butter the microorganisms count (QMAFAnM and yeast and mold) also increases and exceeds the maximum residue limit.

Taking all the above mentioned facts we can suggest the following:

- It is essential to control the quality of raw material for butter production.
- It is necessary to develop and improve techniques for butter storage and packaging.
- It is important to use a traceability system to identify potential risks.

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Internationalization as a way of adding value and attractiveness to university education

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Abstract
Internationalization in case of universities means creating links and strengthening cooperation with partners all around the world in order to ensure study or research opportunities with different aims and for various target groups, students as well as teaching and other staff included. The Faculty of Economics and Management of the Slovak University of Agriculture in Nitra, Slovakia is an active applicant in most of the published project calls. Several years of experience is used in managing and administering projects within the frameworks such as CEEPUS (Central European Exchange Program for University Studies), Erasmus+ (framework program for education, training, youth and sport), including Erasmus Mundus and TEMPUS programs. These possibilities offer study and research mobilities that benefit both the participants and the home and host universities, by providing feedback from their practice to be applied in future projects. The faculty supports the idea that a study stay during university studies shall be an essential part of the university studies for most of the students, thus in addition to short-term exchanges an International Master Double Degree Program in Business Economics will be provided jointly by the University of Agriculture in Krakow, Poland and the Slovak University of Agriculture in Nitra, Slovakia from the academic year 2016/2017. The paper includes information related to the project "Development of Public Accreditation of Agricultural programs in Russia (PACAgro) 2013-2016" (Project No. 543902-TEMPUS-1-2013-SK-TEMPUS-SMGR, co-funded by the Tempus Programme of the European Union).

Keywords: *CEEPUS, Erasmus, Internationalization, mobility, TEMPUS*

JEL Classification: *I2, I20, I21, I23, I25*

1. Introduction

Well-performing education as a result of investment into knowledge shall be the core of any educational institution providing new skills and competences, which in the end will benefit not only the institution and the individual, but the society as well, ensuring competitiveness on the labour market and social inclusion.

Internationalization in case of universities means creating links and strengthening cooperation with partners all around the world in order to ensure study or research opportunities with different aims and for various target groups, students as well as teaching and other staff included.

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2. Data and Methods

The paper includes data and information gathered from practice and analysed during years of working on various international projects and the best experience and observations from them resulting in the idea of the double-degree programme offered by the University of Agriculture in Krakow, Poland and the Slovak University of Agriculture in Nitra, Slovakia.

3. Results and Discussion

The Faculty of Economics and Management of the Slovak University of Agriculture in Nitra, Slovakia is an active applicant in most of the project calls published by the European Commission and related organisations. Several years of experience enable managing and administering projects within the frameworks such as CEEPUS (Central European Exchange Program for University Studies), Erasmus+ (framework program for education, training, youth and sport), including Erasmus Mundus and TEMPUS programs at the faculty. The following paragraphs will introduce the added value and attractiveness of university education benefiting from international projects.

3.1 CEEPUS

CEEPUS is an acronym for "Central European Exchange Program for University Studies". The framework enables university networks of cooperating partner universities exchanging students and teachers with mobility grants, while the main objective of the CEEPUS III agreement is focus on joint programs (ideally leading to Joint Degrees, especially Joint Doctoral Programs) and promotion of cooperation in the framework of the EUSDR (EU Strategy for the Danube Region).

The legal basis for CEEPUS is an international Agreement signed by the member states and open for accession. Current member countries include Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Hungary, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, the Slovak Republic and Slovenia, Prishtina/Kosovo is also participating (CEEPUS, 2016a).

The lean management organizational structure includes the highest ranking decision making body which is the Joint Committee of Ministers that meets once a year and takes all strategic decisions (CEEPUS, 2016c). The Central CEEPUS Office (operated by the secretary general and her assistant) ensures coordination, evaluation, program development and advertising (CEEPUS, 2016b). Except that, each country operates a National CEEPUS Office in charge of national implementation, these offices are integrated into already existing structures, usually national agencies (CEEPUS, 2016d).

Within CEEPUS, instead of transfer of funds the internal currency of "1 scholarship month" is used, defined as a full scholarship according to the local standard of living (for this the Joint Committee of Ministers is in charge, as well as for the overall budget). Each country pays its incoming students and teachers and has to pledge at least 100 scholarship months per academic year. Teachers have a workload of at least 6 teaching or supervising hours a week (i.e. a stay of 5 workdays) at the host university, while student mobilities can be awarded for a minimum of 3 months and a maximum of 10 months, with shorter stays permitted only for students working on their these or dissertations.

The mobility network *Applied Economics and Management* is functioning at the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra for almost ten years and currently includes 23 European universities and distributes around 80 scholarship months each year among partner countries. Partner universities are:

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- the Slovak University of Agriculture in Nitra, Faculty of Economics and Management, the Slovak Republic,
- University "Fan S. Noli" KORCA, Faculty of Agriculture, Albania,
- BOKU - University of Natural Resources and Life Sciences, Vienna, Institute of Marketing and Innovation, Austria,
- FH Joanneum - University of Applied Sciences, Department of International Management, Austria,
- University of National and World Economy, Department of Natural Resources Economics, Bulgaria,
- University of Zagreb, Faculty of Agriculture, Croatia,
- Mendel University in Brno, Faculty of Business Economics, the Czech Republic,
- Czech University of Life Sciences Prague, Faculty of Economics and Management, the Czech Republic,
- University of South Bohemia České Budějovice, Faculty of Economics, the Czech Republic,
- University of Szeged, Faculty of Engineering, Hungary,
- Szent István University, Faculty of Economics and Social Sciences, Hungary,
- State University of Tetovo, Faculty of Economics, Macedonia,
- Technical University of Moldova, Engineering and Management in Production Systems, Moldova,
- State University of Balti „Alecu Russo", Faculty of Techniques, Physics, Mathematics and Informatics, Moldova,
- University of Montenegro, Faculty of Economics, Montenegro,
- Cracow University of Economics, Department of Entrepreneurship and Innovation, Faculty of Economics and International Relations, Poland,
- Poznan University of Economics, Faculty of Management, Poland,
- University of Agriculture in Krakow, Faculty of Agriculture and Economics, Poland,
- Warsaw University of Life Sciences, Faculty of Economic Sciences, Poland,
- The Academy of Economic Studies of Bucharest, Faculty of Agri-food and Environmental Economy, Romania,
- University of Novi Sad, Faculty of Technical Sciences, Department of Industrial Engineering and Management, Serbia,
- University of Ljubljana, Biotechnical Faculty, Slovenia,
- University of Primorska, Faculty of Management Koper, Slovenia.

3.2 Erasmus+

Erasmus+ is the EU Programme enabling cooperation in the fields of education, training, youth and sport for the period 2014-2020 (OJEU, 2013). According to the main aim of the programme, all of the mentioned areas (education, training, youth and sport) can make a major contribution to help tackle socio-economic changes, the key challenges that Europe will be facing until the end of the decade and to support the implementation of the European policy agenda for growth, jobs, equity and social inclusion (European Commission, 2016; European Commission, 2015b).

The main changes since 2015 include new opportunities in Vocational Education and Training Mobility (with the possibility to apply with and without a VET Charter), more targeted Strategic Partnerships (clearer distinction between the aims innovation and exchange of best practices), revised format of Sector Skills Alliances as well as new opportunities in sport.

The FEM SUA in Nitra is an active applicant of most of the calls within this initiative, especially within the Key Action 2 (Cooperation for innovation and the exchange of good practices) and among that the Capacity building in the field of higher education and the Strategic Partnerships projects.

Successful most recent project initiatives include:

- Erasmus+ KA2 Strategic partnerships project: *Food Quality and Consumer Studies*, No. 2014-1-SK01-KA2013-000464 (coordinator: the FEM SUA in Nitra),
- Erasmus+ KA2 Capacity Building in Higher Education project: *Vocational training center for undergraduate university students and teachers in Jordan*, No. 561708-EPP-1-2015-1-DE-EPPKA2-CBHE-JP (coordinator: the Leipzig University of Applied Sciences),
- Erasmus+ KA2 Capacity Building in Higher Education project: *Modernising Human Resource Management in South Mediterranean Higher Education*, No. 581810-EPP-1-2015-1-JO-EPPKA2-CBHE-JP (coordinator: the Princess Sumaya University for Technology, Jordan).

3.3 Erasmus Mundus

Erasmus Mundus is another cooperation and mobility programme in the field of higher education. Its main aim is to enhance the quality of European higher education and to promote dialogue and understanding between people and cultures through cooperation with Third Countries. Except that, it contributes to the development of human resources and the international cooperation capacity of higher education institutions in Third Countries by increasing mobilities between the EU and these countries (EACEA, 2016).

The FEM SUA in Nitra is included as a project partner within the project named *European Union – Latin America Academic Links – EULALinks SENSE 2014-2018* (within the Action 2 Strand 1 Lot 8, Latin America, 2014-0874/001-001). The main coordinator of the project is the Humboldt-Universität zu Berlin (HU) in Germany.

The mobility scheme EULALinks SENSE consists of mobilities including undergraduate, master, doctorate, post-doctorate and staff levels for both Latin Americans and Europeans. The mobility flows promote multilateral cooperation between partners of the consortium. Students and staff in host and home universities benefit from the mobility scheme as they come into contact with people from other linguistic and cultural environment. Through the mobility scheme the society is enriched by open-minded and internationally experienced academics and students. This will also increase links between Europe and Latin America in all spheres of society thus contributing to cultural dialogue and mutual understanding (EULALinks SENSE, 2016). The different types of individual mobilities (in total 176) are awarded within the limits as follows: undergraduate (ca. 31 % of the total), master (ca. 25 % of the total), doctorate (ca. 20 % of the total), post-doctorate (ca. 14 % of the total), staff (ca. 10 % of the total). The project focuses on three target groups:

- Target group 1 (TG1): students registered at one of the Latin American Partner universities or European Partner universities at the time of submitting their application to the partnership. Undergraduate students must have successfully completed at least one year of studies in their home institution (54 % of the total).
- Target group 2 (TG2): students either registered in a Higher Education Institution (HEI) (not included in the partnership) of one of the Latin American countries concerned by the lot OR to have obtained a university degree or equivalent from a HEI of these countries. EU citizens registered in a European University (not included in the

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partnership) or who have graduated at a university from an European country (13 % of the total).

- Target group 3 (TG3): students of one of the Partner countries in Latin America, who are part of the vulnerable target group (e.g. applicants with indigene origin) (33 % of the total).

During the academic year 2015/2016 we have welcomed 7 students from Latin America to our university (6 undergraduates for 6 months respectively and 1 doctoral student for 10 months, from which 2 were from Mexico, 4 from Colombia and 1 from El Salvador) and for the academic year 2016/2017 we will accept another 2 students from Guatemala and El Salvador. We can state that the already finished mobilities all enhanced the quality of the internationalization process at the university and applicants submitting their application forms are still expected within the third call.

Partners of the EULALinks SENSE project include the following institutions:

- European Partners:
  - Humboldt-Universität zu Berlin (HU), Germany,
  - Universidad de Cordoba (UCO), Spain,
  - Université SupAgro Montpellier (SupAgro), France,
  - Czech University of Life Sciences (CULS), Prague, Czech Republic,
  - Slovak University of Agriculture in Nitra (SUA), Slovakia,
  - University of Natural Resources and Life Sciences (BOKU), Vienna, Austria,
  - Sapienza University of Roma (Uniroma1), Italy,
  - University of Extremadura, Badajoz / Cáceres, Spain,
- Latin American Partners:
  - Universidad Autónoma Chapingo (UACh), Texcoco, Mexico,
  - Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense (URACCAN), Managua, Nicaragua,
  - Universidad del Magdalena (Unimagdalena), Santa Marta, Colombia,
  - Universidad de los Llanos (Unillanos), Villavicencio, Colombia,
  - Universidad Nacional Autónoma de Nicaragua (UNAN), Managua, Nicaragua,
  - Universidad Pedagógica Nacional Francisco Morazán (UPNFP), Honduras,
  - Universidad Rafael Landívar (URL), Ciudad de Guatemala, Guatemala,
  - Universidad San Carlos de Guatemala (USAC), Ciudad de Guatemala, Guatemala,
  - Universidad Veracruzana (UV), Veracruz, Mexico,
  - Universidad de El Salvador, San Salvador, El Salvador,
  - Facultad Latinoamericana de Ciencias Sociales (FLACSO), Curridabat, Costa Rica,
  - Universidad Nacional de Honduras (UNAH), Tegucigalpa, Honduras,
- Associate Partners:
  - The European Alliance on Agricultural Knowledge for Development (Agrinatura), Prague, Czech Republic,
  - Deutsch-Mexikanische Gesellschaft Berlin e.V. (DMGB), Berlin, Germany,
  - Universidad Centroamericana "José Simeón Cañas" (UCA), San Salvador, El Salvador,
  - Fundación Nacional para el Desarrollo (FUNDE), San Salvador, El Salvador,
  - Resguardo Kogi-Malayo-Arhuaco, Santa Marta, Colombia,
  - Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires, Argentina,
  - Corporación Rimisp – Centro Latinoamericano para el Desarrollo Rural (Rimisp), Santiago de Chile, Chile,

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- Fondo de Desarrollo Indígena Guatemalteco (FODIGUA), Guatemala City, Guatemala.

3.4 International Master Double Degree Program in Business Economics

The FEM SUA in Nitra supports the idea that a study stay during university studies shall be an essential part of the university studies for most of the students, thus in addition to short-term exchanges an *International Master Double Degree Program in Business Economics* (MSc ECONBIZ) will be provided jointly by the University of Agriculture in Krakow, Poland and the Slovak University of Agriculture in Nitra, Slovakia from the academic year 2016/2017.

Graduates of the international master double degree program in Business Economics will be able to analyse complex economic relations in business processes, propose and implement managerial decisions related to functioning of those processes. They shall apply a high degree of autonomy and creativity at managerial decision making and command a deep knowledge not only from operative business management, but also from the area of strategic decisions from viewpoint of globalization and economy as well.

Specification of the program is designed with the aim the graduates will be able to master managerial functions at top business management level, with priority given to agricultural primary production and food industry both as universal manager and specialist manager as well.

Due to international dimension of the study program graduates will gain practical experience, knowledge and skills from Visegrad / Central European region in a form of thematic excursions to partner institutions (business sphere, universities, European institutions) in Slovakia, Hungary, Austria, Poland and the Czech Republic.

The duration of the *International Master Double Degree Program in Business Economics* will be four semesters, with 120 ECTS credits to be achieved. The first and third semester of the program will be attended at the Slovak University of Agriculture in Nitra. The second semester will be attended at the University of Agriculture in Krakow, while the fourth semester is assigned to one course at the University of Agriculture in Krakow and the preparation of the master thesis at the home university and finish the programme with a Final Scientific Colloquium, in which the results of the thesis will be presented and discussed in a critical manner (thesis defence) and knowledge of the profile courses will be verified also.

The official language of instruction will be English, with a strong recommendation to apply also national languages (Slovak and Polish). Students will be encouraged to study Slovak or Polish language as the foreign language during their stay in Slovakia or Poland respectively.

During the study, each university will send to the second university a Transcript of Records to summarize all measurable achievements (ECTS, grades) during each semester achieved at another university. All records will be part of a diploma supplement with full recognition of all ECTS credits obtained during the master program. A diploma supplement will be used indicating all obtained ECTS credits with specification of training hours, language of instruction, the place of the course and all other relevant details. Evaluation and marks of exams will correspond with the rules of ECTS at each of the cooperating institutions.

After passing the final examination, both universities will award the academic Master degree in „Business Economics“ and title “inžinier – Ing.” at the Slovak University of Agriculture in Nitra and the title “magister” at the University of Agriculture in Cracow.

4. Conclusion

Some possibilities offering study and research mobilities at the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra that benefit both the participants and the home and host universities, by providing feedback from their practice to be applied in future projects, were described in the presented paper. The faculty supports the idea that a study stay during university studies shall be an essential part of the university studies for most of the students, therefore an International Master Double Degree Program in Business Economics will be provided from the academic year 2016/2017, created based on years of experience from managing and administering mobility projects.

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The problem of cheating and plagiarism of students at the Faculty of Economics and Management of SUA in Nitra

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Abstract
Cheating on different levels of education is not new in our country. Students of primary schools use various illegal aids. Many students have no problem to use cheat sheets even in universities (it's not only a problem of full-time students but external students too). A possible cause may be that some subjects are considered as unnecessary for students, so they try to circumvent them in other ways. Another cause may be the actual value of education itself - students rarely realize that each acquired knowledge or fact can become handy later in their life. However they resort to cheating not only on crediting tests or exams, but also in creating a variety of term projects. The main issue solved in this article is cheating and plagiarism of students at the Faculty of Economics and Management in Nitra, because the results of the questionnaire survey suggest that it is relatively a big problem.

Keywords: *cheating, plagiarism, students*

JEL Classification: *I21, I23*

1. Introduction

Academic cheating is defined as representing someone else's work as your own. It can take many forms, including sharing another's work, purchasing a term paper or test questions in advance or paying another person to do the work for you. Cheating no longer carries the stigma that it used to. Less social disapproval coupled with increased competition for admission into universities and graduate schools made students more willing to do whatever it takes to get the A grade. According to OpenStudy's (2010) experience, cheating is any work done with others that the professor made clear it should not be worked on jointly. This "unauthorized collaboration" ranges from professor to professor, university to university, and assignment to assignment. Another definition said that cheating is defined as obtaining or attempting to obtain, or aiding another person to obtain credit for work, or any improvement in evaluation of performance, by any dishonest or deceptive means. Cheating includes, but is not limited to: lying; copying from another's test or examination; discussing answers or questions on an examination or test at any given time, unless such discussion is specifically authorized by the instructor; taking or receiving copies of an exam without the permission of the instructor; using or displaying notes, "cheat sheets", or other information devices inappropriate to the prescribed test conditions; allowing someone other than the officially enrolled student to represent the same (Cal Poly, 2016). It is important to understand what motivates students to cheat. Here are the most commonly reasons for student cheating: need to excel at any cost, semester workload too heavy, too many tests on one day, pressure from parents, helping a friend, good grades needed for job etc. (Point Loma Nazarene University, 2012). Cheating affects both the equity of instruction and the learning process, resulting in students who are less prepared to advance in education or apply learned knowledge (Lupton, Chapman &Weiss, 2000).

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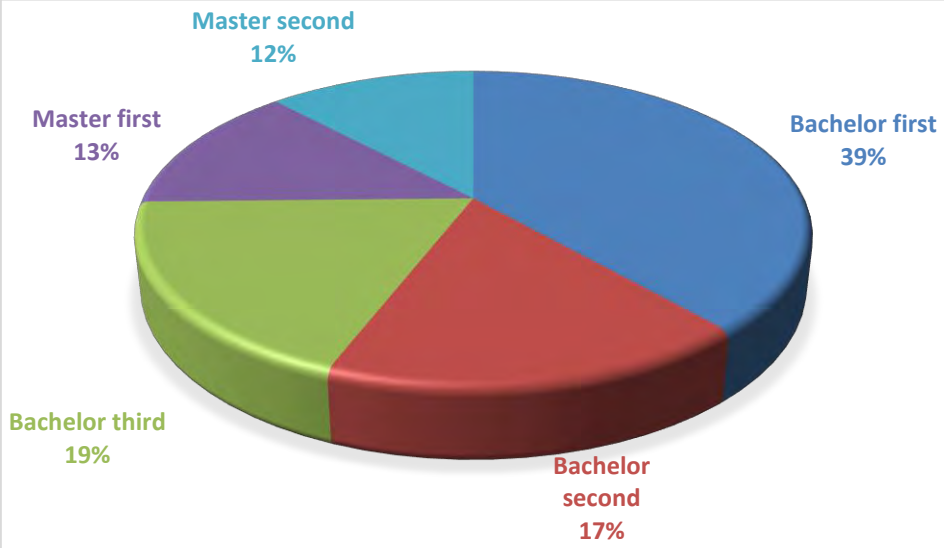
Plagiarism is defined as the act of using the ideas or work of another person or persons as if they were one's own without giving proper credit to the source. An act is not plagiarism if it is ascertained that the ideas were arrived through independent reasoning or logic or the thought or idea is common knowledge (Cal Poly, 2016). According Boisvert and Irwin (2006) plagiarism is the verbatim copying, near-verbatim copying, or purposely paraphrasing portions of another author's paper. Plagiarism may also be defined as the use of another person's words and/or ideas without acknowledging that the ideas and/or words belong to someone else. It is not a new phenomenon, nor is it something exclusive to the discipline of economics, but there is little doubt that it is a growing problem that lecturers need to address systematically if the underlying causes, rather than the symptoms, are to be addressed (Williams, 2005). In student's case, if a student cannot come up with his or her own ideas, and time is running short before the hand-in date, then cut-and-paste technology allows him or her to lift someone else's sentences or phrases with ease. Indeed students often cannot see anything wrong with this.

2. Data and Methods

The collection of data was done through a questionnaire survey at the Faculty of Economics and Management in 2014. The questionnaire contained 19 questions and at the end the respondent has the opportunity to express his or her opinion. The first four questions were identification questions - gender, year of study, study program and form of study. Other questions have already been addressed directly through the survey respondents' opinions on cheating and plagiarism. Some questions focused on the approval or disapproval of respondents, in others it was possible to tick more options and the last category was questions evaluated using the Likert scale (used to measure the opinions and attitudes of people). The questionnaire was anonymous, so it was assumed that respondents are honest. 2409 students were asked through emails, for which 592 responses were received – this means a 24.57% return rate. Structure of the respondents according to the year of study is represented in Figure 1.

Figure 1: The structure of the survey sample according to year of study



Source: own research

Basic statistical methods were used for the evaluation as well as the Chi-Square test of Independence.

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The Chi-Square test of Independence is used to determine if there is a significant relationship between the two nominal (categorical) variables. We are interested in examining if the two categorical variables are related or associated (i.e. dependent). First we have to calculate the expected value of the two nominal variables. After calculating the expected value, we can apply the following formula to calculate the value of the Chi-Square test of Independence:

$$\chi^2 = \sum_{i=1}^{y} \sum_{j=1}^{c} \frac{(O_{ij}-E_{ij})^2}{E_{ij}} \qquad (1)$$

where

χ^2 = Chi-Square test of Independence
O_{ij} = observed value of two nominal variables
E_{ij} = expected value of two nominal variables

Hypotheses for testing are:

H_0: In the population, the two categorical variables are independent.
H_1: In the population, two categorical variables are dependent.

The article presents some selected results about cheating during exams and opinions about plagiarism.

3. Results and Discussion

One question in the questionnaire survey was: *Have you ever cheated on an exam?* In this question it was possible to choose only a yes or no answer. If the respondent answered yes, it was attached to a sub-question of how many times it was. The options given were 0-5 times, 6-10 times, 11-15 times and 15 times or more. The results are shown in Table 1, where answers to these questions are compared with given study year. Overall the data in the evaluation of this question in comparison with the study year shows that the largest number of cheats in exams is in the range of 0-5 times in all study years. The positive fact is that with the increasing study year, the number of cheats decreases. Students may start to realize that it is time to rely on their own knowledge, the closer the end of the study is.

Table 1: Cheating at exams

Answers	Yes		No
0 - 5	**69,93%**		**22,64%**
Bachelor first	24,32%	Bachelor first	13,68%
Bachelor second	12,84%	Bachelor second	3,21%
Bachelor third	13,85%	Bachelor third	3,04%
Master first	9,63%	Master first	1,69%
Master second	9,29%	Master second	1,01%
6 - 10	**5,24%**		
Bachelor first	0,51%		
Bachelor second	1,01%		
Bachelor third	1,52%		
Master first	1,18%		
Master second	1,01%		
11 - 15	**0,51%**		
Master first	0,17%		
Master second	0,34%		
15 and more	**1,69%**		
Bachelor second	0,34%		

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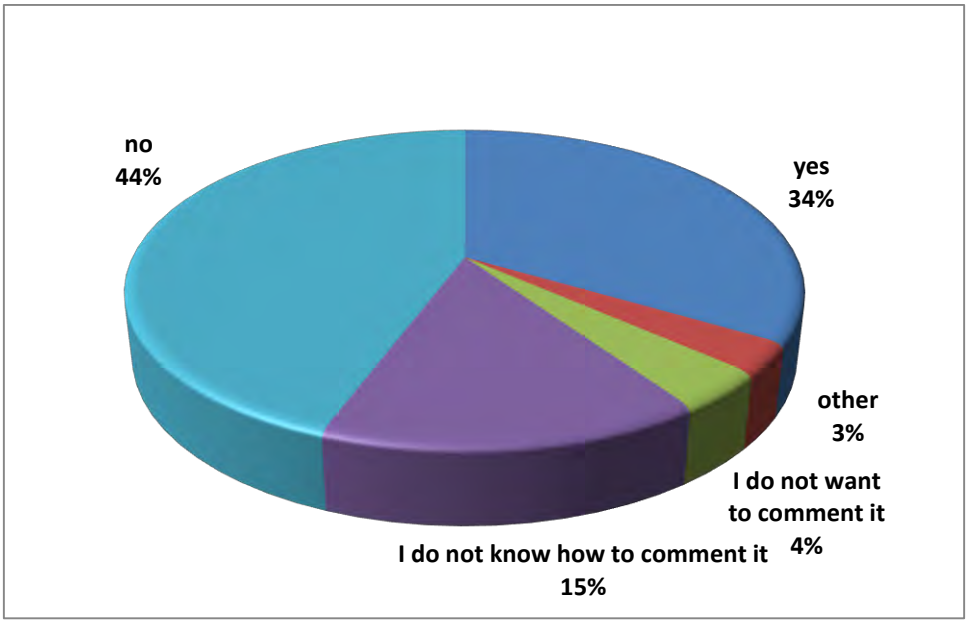
Bachelor third	0,34%
Master first	0,68%
Master second	0,34%

Source: own research

In a question of cheating methods the most highly reported cheating behavior was using cheat sheets (21.79%), using electronic devices (12.50%) and transcription from someone else (11.32%).

Very interesting are the findings for the question: *Do you think it is possible to obtain a university diploma only by cheating on exams?* This question contains five options; yes, no, I do not want to comment it, I do not know how to comment it, and other. Evaluation of this question is shown in Figure 2. In this question, 44% of the respondents believe that it is not possible to obtain a university diploma only by cheating. It is interesting that 34% of the respondents think that it is possible. It is a relatively a high number considering the fact that demonstration of the education is highly desired in today's job market.

Figure 2: The possibility of obtaining a diploma by cheating



Source: own research

In a question about plagiarism „*Do you know the term plagiarism?*" the respondents had five options according the Likert evaluation scale. The possibilities were: yes, rather yes, I do not know, rather no and no. In this question, 88% of the respondents said that they know the term plagiarism and only 2% of the respondents said that they do not know this term. Students who mostly knew about this term are students of the first study year of the bachelor degree.

In another question „*Did you mention in your works the literary sources?*" the respondents had only two possibilities – yes and no. As many as 98% of the respondents stated yes. This means that students are aware of the importance of correct placing of literature sources.

Last question was about overall statement of the respondents if it's correct to sign own name to another persons work. The precise wording of the question was: *Do you think it is correct to sign up under someone else's work?* More than three quarters of the respondents (76%) said that it is not correct to sign own name under the some else's work. Only 1% of respondents claim, that it is correct.

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The Chi-Square test of Independence shows some dependencies between student identification indicators and selected opinion questions. The results are shown in Table 2.

Table 2: Dependence of the student identification indicator on selected opinion question.

Question	*Study year*		*Study program*	
Have you ever cheated on an exam?	**	<.0001	-	0,0973
Do you think it's possible to obtain a university diploma only by cheating on exams?	**	0,003	**	0,0006
Do you know the term plagiarism?	**	<.0001	-	0,2649
Did you mention in your works the literary sources?	-	0,6948	-	0,9544
Do you think, it is correct to sign up under someone else's work?	**	<.0001	-	0,8421

Note: - P-value > 0.05 statistically not significant dependence, * P-value < 0.05 statistically significant dependence, ** P-value < 0.01 statistically highly significant dependence.

According to these results there is a statistically highly significant dependence between all mentioned questions and the study year. Also there is a statistically highly significant dependence between the question about the possibility to obtain university diploma only by cheating and the study program.

4. Conclusion

Cheating has always been, is and probably will be an integral and at the same time undesirable part of the study of university students. Cheating is seen by many students as means to a profitable end. It is evident in the many surveys as well as the opinions of students, who have indicated some form of cheating. The results of the questionnaire survey implemented in the faculty also show that our students use illegal appropriations during exams and 34% of the respondents think that it's possible to obtain a university diploma only by cheating.

Plagiarism is a similar problem. According to the survey results, it can be concluded that 88% of the respondents know this term and 98% of the respondents said that they write literary sources correctly in their works. Overall, in spite of some answers on issues related to cheating and plagiarism, students have sufficient ethical inhibitions and 76% of the respondents said that it is wrong to sign up under someone else's work.

In the end, here are some students' opinions:

„copying and plagiarism is not fair… many students prepare at home, make every effort to pass the exams, credits, but sometimes even that does not work ... and others, which use this anger tend to have higher level happiness than those who are really trying. I think it is an injustice to the honest students"

„Plagiarism is theft. The student would in any work bring his or her own view on the issue and particularly in the diploma thesis should address the topics related to the real requirements of the practice."

„I think it is possible to obtain a diploma only by cheating, but it's not right and not fair to other students who are learning and who don't cheat."

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Some remarks on learner autonomy in ESP classes

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Abstract
Nowadays, new approaches and methods are used in the field of foreign language teaching and learning. The approaches and methods take into consideration individual differences among students and support their independence in the process of foreign language acquisition. These individual approaches are based on respecting learners´ specific features, developing their personality and supporting their activity in the classroom. Learner autonomy is also considered to be one of the above mentioned approaches. The article presents the results of the experiment based on integrating the principles of autonomous approach into ESP (English for Specific Purposes) classes at the Department of Languages, Faculty of Economics and Management, Slovak University of Agriculture in Nitra.

Key words: *authentic texts, ESP, experiment, learner autonomy, learner training, vocabulary*

JEL classification: *I, I23*

1 Introduction

Nowadays, attention of the member states of the European Union is also paid to the language policy. Promoting language learning is considered to be a must because of the growing mobility of citizens of the European Union within Europe. The key attention is paid to lifelong learning as well.

One of the main goals of foreign language teaching and learning is to use such methods and approaches which support independent thinking, opinions and performance of individuals and which are based on motivation, needs and wants of learners. As a result, learners and their individual needs should be in the centre of teachers´ attention.

The above mentioned change has also resulted from the critical approach of teachers to traditional methods which fail to involve learners in the teaching and learning process. The teachers have gradually come into conclusion that if they want their students to learn more effectively, they have to know them better because only then they will be able to adapt the conditions of the educational process to the students' individual needs. Therefore, individual approaches to learners have been introduced into the context of foreign language teaching and learning.

The individual approaches are reflected in self-directed learning, self-instruction or learner autonomy. These approaches are focused on individuals who are taught to take responsibility for their own learning in order to become more independent of teachers and thus, to be prepared for lifelong learning.

The article presents the results of the experimental research conducted at the non-philological university – the Slovak University of Agriculture in Nitra. Within the research, the students of the selected ESP classes were acquainted with the principles of learner autonomy through learner training and activities based on authentic texts. The main aim was to teach them how to

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learn the English language more effectively in order to take more responsibility for their own learning and thus become independent of their teachers.

1.1 Learner autonomy

There are several definitions of autonomy but we completely agree with the one presented by Scharle and Szabó (2000). According to them, "*autonomy is the freedom and ability to manage one´s own affairs, which entails the right to make decisions as well*" (Scharle & Szabó, 2000, p.4). Benson (1997) recognizes three versions of learner autonomy in the field of language education:

1. technical version – "*the act of learning a language outside the framework of an educational institution and without the intervention of a teacher*" (Benson, 1997, p. 19);
2. psychological version – "*a capacity – a construct of attitudes and abilities – which allows learners to take more responsibility for their own learning*" (Benson, 1997, p.19);
3. political version – ability which "*allows learners to control both their own individual learning and the institutional context within which it takes place*" (Benson, 1997, p. 19).

In 1979, the first official document connected with learner autonomy in the context of foreign language learning was written by Holec for the Council of Europe and was called *Autonomy and Foreign Language Learning* (in Holec, 1981). In this document, Holec (1981, p.3) outlines that learner autonomy is the ability of an individual to take charge of his/her own learning. In other words, learner autonomy represents a situation in which a learner is responsible for all the decisions concerning all aspects of his/her own learning, e.g. determining the objectives, defining the contents, selecting methods and techniques and evaluating what has been acquired (Holec, 1981, pp. 3-4).

The ability of taking charge of one's own learning is not inborn and therefore, "*(it) must be acquired either by 'natural' means or (...) by formal learning, ie in a systematic, deliberate way*"(Holec, 1981, p. 3). The acceptance of responsibility for one's learning can be done with or without the help of a teacher. As it is stated by Dam (2001, p. 49), learner autonomy „*can be described as what takes place in situations in which the teacher is expected to provide a learning environment where the learners are given the possibility consciously to be involved in their own learning and thus become autonomous learners*."

It is clear that fully autonomous learners are able to formulate their own learning objectives, use appropriate learning strategies, monitor their own learning, organize their time and exploit the available language learning resources. But there are only a few learners who are completely autonomous of their teachers. Therefore, the main task of teachers is to help their students become autonomous, i.e. to teach/train them how to learn. Also Dickinson (1992) claims that "*the ability to learn independently is a proper outcome of teaching, and has long been the concern of the teacher*." As a result, the main objective of learner training conducted by teachers is to improve the effectiveness of one's learning, because effective learning is part of being autonomous.

1.2 Learner training

Williams and Burden (1997) stress that "*learner training (...) is concerned with ways of teaching learners explicitly the techniques of learning a language, and an awareness of how and when to use strategies.*" Also Tudor (1996, s. 37) defines learner training as the process "*by which learners are helped to deepen their understanding of the nature of language learning,*

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and to acquire the knowledge and skills they need in order to pursue their learning goals in an informed and self-directive manner." So, through learner training students are taught how to learn and are acquainted with such skills and strategies which can help them reach their learning objectives. This fact is also supported by Ellis and Sinclair (1989, cited in Dickinson, 1992) who claim that "*learner training aims to help learners consider the factors that affect their learning and discover the learning strategies that suit them best. It focuses their attention on the process of learning so that the emphasis is on* ***how*** *to learn rather than on* ***what*** *to learn*."

Thus, the main objective of learner training is to:

1. make everyone a better learner;
2. make everyone more capable of independent learning and
3. prepare everyone to become partly or wholly autonomous in his/her learning (Dickinson, 1992).

Learner training consists of the following areas:

a) learning styles,
b) multiple intelligences,
c) learning strategies,
d) autonomous assessment and self-assessment,
e) language awareness and
f) language learning awareness (Dickinson, 1992; Ellis & Sinclair, 1993).

In our experiment, the main emphasis was put on training learners how to use learning strategies effectively; therefore, other areas of learner training are not discussed in the chapters which follow.

1.2.1 Learning strategies

According to Reid (1998, p. ix), learning strategies are "*external skills often used consciously by students to improve their learning.*" O'Malley and Chamot (1990, p. 1) characterize learning strategies as „*the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information*." A similar definition of learning strategies is presented by Oxford (1990, p. 8) who claims that „*learning strategies are operations employed by the learner to aid the acquisition, storage, retrieval, and use of information…All appropriate language learning strategies are oriented toward the broad goal of communicative competence. Development of communicative competence requires realistic interaction among learners using meaningful, contextualized language. Learning strategies help learners participate in such authentic communication."* Also another author who deals with learning strategies states that these are „*mental steps or operations that learners use to learn a new language and to regulate their efforts to do so. They are one type of learner training content that should be included in plans to promote learner autonomy*" (Wenden, 1991, p. 18).

According to O'Malley and Chamot (1990), learning strategies are divided into:

a) cognitive strategies,
b) metacognitive strategies and
c) social/affective strategies.

On the other hand, Wenden (1991) recognizes only:

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a) cognitive strategies and

b) self-management strategies (= metacognitive strategies according to O'Malley & Chamot, 1990).

Oxford (1990), who deals with learning strategies in detail, divides them into two main groups:

a) direct strategies and

b) indirect strategies.

On the one hand, direct strategies are those which are directly connected with the target language and which "*require mental processing of the language, but the three groups of direct strategies (memory, cognitive and compensation) do this processing differently and for different purposes*"(Oxford, 1990, p. 37). On the other hand, indirect strategies are those which "*support and manage language learning without (in many instances) directly involving the target language*"(Oxford, 1990, p. 135).

These two main groups of strategies are further subdivided into subgroups as follows (Oxford, 1990):

a) direct strategies:

   i. memory strategies (e.g. creating mental linkage; applying images and sounds; reviewing well; employing action);

   ii. cognitive strategies (e.g. repeating; getting the idea quickly; analyzing; translating; taking notes; summarizing; highlighting) and

   iii. compensation strategies (e.g. guessing intelligently; getting help; using mine or gesture; avoiding communication; selecting the topic);

b) indirect strategies:

   i. metacognitive strategies (e.g. paying attention; arranging and planning your learning: finding out about language learning, organizing, identifying the purpose of a language task, planning for a language task; evaluating your learning: self-monitoring, self-evaluating);

   ii. affective strategies (e.g. lowering your anxiety; encouraging yourself; taking your emotional temperature: writing a language learning diary, discussing your feelings with someone else) and

   iii. social strategies (e.g. asking questions; cooperating with others; empathizing with others) (Oxford, 1990).

In our experiment, we aimed at those learning strategies which are necessary for learning new vocabulary and reading authentic texts.

1.3 Authentic texts

Activities designed around authentic texts (in some books the expression 'authentic materials' is used, e.g. Homolová, 2003)) can play a major role in promoting learner autonomy, i.e. "*in enhancing positive attitudes to learning, in promoting the development of a wide range of skills, and in enabling students to work independently of the teacher*" (McGarry, 1995, p.3). Authentic texts also " *provide students with bridges to the real world of the target language community*" (McGarry, 1995, p.3).

Little (1997, p. 225) states that the authentic text is „ *(i) the record of any communicative act in speech or writing that was originally performed in fulfilment of some personal or social*

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function, and not in order to provide illustrative material for language teaching and – by extension – (ii) any communicative event that can easily become such a record, for example, radio and television broadcasts and certain forms of electronic communication." It means that authentic texts are not only materials from newspapers, magazines, or books but also materials from radio broadcasts, television programmes, films, etc.

In the experiment, a portfolio of authentic texts from newspapers, magazines, books, and online newspapers and magazines was prepared for the language learning purposes. Then, activities involving different learning strategies were designed by the teacher (Holúbeková, 2007). The main idea was to meet specific needs and requirements of the students and offer them unique opportunities for promoting learner autonomy.

2 Experimental research

The aim of our research was to answer the research question to what extent learner autonomy, especially the principles of learner training, can be implemented into the ESP classes at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra.

Three hypotheses were used to verify the main research question. The first hypothesis was connected with the implementation of principles of learner autonomy, especially learner training, into the ESP classes. It was stated that the final exam results of the students of the experimental group would be significantly better than the results of the students of the controlled group. The second hypothesis was focused on investigation of the impact of strategy training (training of strategies connected with learning vocabulary) on the results of the final vocabulary tests of the students of the experimental group. The last hypothesis was aimed at investigating how strategy training concerning reading comprehension (authentic texts) can influence the results of the final tests of the students of the experimental group. The first two hypotheses were further subdivided into two, one comparing the results of the experimental and controlled groups at the end of the experiment (posttests) and the second one comparing the results of the experimental group at the beginning and at the end of the experiment (a pretest and a posttest within this group). The last hypothesis referred to comparing the posttest results of the students of the experimental and controlled groups.

Research question 1

How can the implementation of the principles of autonomous approach to learning influence the results of the final exam tests of students?

Hypothesis 1

H_1: If the students of the experimental group are acquainted with the principles of the autonomous approach to learning, then they:

- reach better posttest results than pretest results (H_{1a}), i.e. the difference between the pretest results and posttest results will be statistically significant;
- reach better posttest results than the students of the controlled group (H_{1b}), i.e. the difference between the posttest results of the experimental group and the controlled group will be statistically significant.

Research question 2

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How does strategy training connected with learning vocabulary influence the results of the vocabulary tests?

Hypothesis 2

H_2: If the students of the experimental group are acquainted with the strategies connected with learning vocabulary, then they:

- reach better posttest results (vocabulary testing) than the students of the controlled group (H_{2a}), i.e. the difference between the posttest results of the experimental group and posttest results of the controlled group will be statistically significant;
- reach better posttest results (vocabulary testing) than pretest results (H_{2b}), i.e. the difference between their posttest results and pretest results will be statistically significant.

Research question3:

How does working with authentic texts influence the results of the final exam tests of learners?

Hypothesis 3

H_3: If the students of the experimental group are acquainted with the strategies aimed at reading authentic texts, then the difference between their posttest results and pretest results will be statistically significant.

Three research methods were used to prove our hypotheses: an experiment with pretests and posttests, questionnaires and an analysis of texts. The experiment with pretests and posttests was the main research method.

Duration of the experiment: winter term and summer term

Number of lessons*:* winter term – 13 weeks (two teaching units a week, one teaching unit = 45 minutes), summer term - 13 weeks (two teaching units a week, one teaching unit = 45 minutes); together 52 teaching units.

The following experimental plans (see Table 1, Table 2 and Table 3) were prepared for the purpose of the experiment:

Table 1: Experimental plan 1

	pretest	**procedure**	**posttest**
controlled group A	yes	p_1 – methods and approaches proposed by the textbook	yes
experimental group B	yes	p_2 – learner autonomy	yes

Source: Author's ideas

Table 2: Experimental plan 2

	pretest	**procedure**	**posttest**
controlled group A	yes	p_1 – acquisition of vocabulary without strategy training	yes
experimental group B	yes	p_2 – acquisition of vocabulary with strategy training	yes

Source: Author's ideas

Table 3: Experimental plan 3

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	pretest	procedure	posttest
controlled group A	yes	p_1 – texts from the textbook	yes
experimental group B	yes	p_2 – authentic texts	yes

Source: Author's ideas

The research was conducted at the Slovak University of Agriculture in Nitra. The second grade students (75 learners) of the Faculty of Economics and Management were the subjects of the experiment. In the course of the school year (two terms), the learners were prepared to take more responsibility for their own learning through learner training and use of authentic texts.

The experiment began at the outset of winter term and finished at the end of summer term. The students were divided into two main groups: an experimental group (two ESP classes, 38 students) and a controlled group (two ESP classes, 37 students). The experimental group was taught through autonomous approach of ESP instruction proposed by Nunan (1997). The approach consists of the following stages: awareness, involvement, intervention, creation and transcendence (Nunan, 1997, see Appendix A). As for the controlled group, the students followed the traditional syllabus designed for the selected ESP classes.

The students of both groups underwent the same tests at the beginning of the experiment (pretest) and at the end of the experiment (posttest). Then, the paired t-test was used to test the hypotheses: H_{1a}, H_{2b}, H_3 and the unpaired t-test was used to test the hypotheses: H_{1b}, H_{2a}.

3 Results and discussion

On the one hand, it has been confirmed that the final test results of the students of the experimental group, who underwent strategy training connected with learning new vocabulary, were significantly better than the results of the students of the controlled group. Also the results of the vocabulary posttests of the students of the experimental group were significantly better than the results of their pretests.

On the other hand, the remaining hypotheses were not confirmed. There are several reasons for that. Firstly, the principles of learner autonomy and learner training were introduced to the students of the experimental group for the first time during their studies at university. Therefore, it was too difficult for them to accept new styles of teaching and learning as well as to take more responsibility for decisions connected with their learning, e.g. determining the objectives, defining the contents, selecting methods and techniques and evaluating what has been acquired. They thought that a teacher should be responsible for all the decisions. Secondly, we agree with Straková (2003) who states that the results of tests of the students, who are trained to be autonomous, cannot be verified in the same way as the results of their knowledge tests. When evaluating the results of autonomous training we should also take into account different levels of students´ autonomy. Therefore, further research aimed at finding out how to measure different levels of students´ autonomy is needed.

4 Conclusion

To sum it up, learner autonomy is one of the language learning approaches which takes into account individual characteristics of learners. Its main aim is to promote responsibility of an individual who is encouraged to learn as independently of a teacher as possible. Learner training based on strategy training and reading authentic texts was the key in promoting learner autonomy in the above mentioned experimental research.

Despite the fact that three of the proposed hypotheses were not confirmed, we could state that the experiment was successful because the students of the experimental group learnt how to:

- determine the objectives of their learning,
- exploit different learning styles and multiple intelligences,
- use different learning strategies,
- work with authentic texts, and
- monitor their learning process.

To conclude, the knowledge of the learner training principles learnt during English lessons can also be transferred to other subjects and help students take more responsibility for their learning.

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Appendix A

Table 4: Autonomy: levels of implementation

Level	Learner action	Content	Process
1	**Awareness**	Learners are made aware of the pedagogical goals and content of the materials they are using.	Learners identify strategy implications of pedagogical tasks and identify their own preferred learning styles/strategies.
2	**Involvement**	Learners are involved in selecting their own goals from a range of alternatives on offer.	Learners make choices among a range of options.
3	**Intervention**	Learners are involved in modifying and adapting the goals and content of the learning programme.	Learners modify/adapt tasks.
4	**Creation**	Learners create their own goals and objectives.	Learners create their own tasks.
5	**Transcendence**	Learners go beyond the classroom and make links between the content of classroom learning and the world beyond.	Learners become teachers and researchers.

Source: Nunan (1997, p. 195)

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Intercultural communication between Chinese and Slovak managers

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Abstract
Recently the political, economic and educational contacts between the People´s Republic of China and the Slovak Republic have been intensified. Chinese language has been taught at the Slovak University of Agriculture since 2014. In order to overcome the cultural limits in the international business negotiations we will concentrate attention on the cross-cultural communication between Chinese and Slovak managers as the successful negotiations require the careful consideration of cultural differences and business etiquette. This article will focus on the behaviour at meetings, verbal and nonverbal communication including some useful suggestions to Slovak and Chinese negotiators involved in the intercultural business negotiations.

Key words: *cross-cultural communication, cultural factors, intercultural business negotiations, verbal and nonverbal communication*

JEL Classification: *F16, I25*

1. Introduction

"The 19th century belonged to England, the 20th century belonged to the US, and the 21st century belongs to China. Invest accordingly" (Warren Edward Buffett).

At the beginning we will concentrate attention on the conception of communication. Communication is generally understood as a process of information exchange. A message or communication is sent by the sender through a communication channel to a receiver, or to multiple receivers. The sender must encode the message (the information being conveyed) into a form that is appropriate to the communication channel, and the receiver(s) then decodes the message to understand its meaning and significance (http://www.skillsyouneed.com/general/what-is-communication.html).

With the trend of the economic globalization and integration, the international negotiators have met the challenges of different cultures during the process of international business negotiation. Cultural factors have often been ignored in making global marketing strategies and decisions. Therefore, some negotiators always commit the mistakes of seeing foreign cultures through their own habitual lenses, which leads to many missteps that can cost the company business. This means that the successful operation of negotiation requires careful consideration of cultural differences.

2. Data and Methods

Cultural diversity should be taken into account as an assumption of mutual understanding. R. Lewis (2006) claims that people of different cultures share basic concepts but view them from different angles and perspectives, leading them to behave in a manner which we may consider irrational or even in direct contradiction of what we hold sacred.

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Intercultural communication refers to exchanging information between people from different cultures. It is defined as the situated communication between individuals or groups of different linguistic and cultural origins. This is derived from the following fundamental definitions: communication is the active relationship established between people through language, and intercultural means that this communicative relationship is between people of different cultures, where culture is the structured manifestation of human behaviour in social life within specific national and local contexts, e.g. political, linguistic, economic, institutional, and professional (http://www.lanqua.eu/theme/intercultural-communication).

According to Lewis (2006) international business apart from practical and technical problems, national psychology and characteristics frequently interferes at the executive level, where decisions tend to be more complex than the practical accords reached between accountants, engineers and other technicians.

Recently the political, economic, cultural and educational contacts between the People´s Republic of China and the Slovak Republic have been intensified. China is the world`s most populated country in the world with 1,406,000,000 inhabitants and its history goes back 5,000 years. Its culture spread itself over many centuries throughout East Asia. Chinese language has been taught at the Slovak University of Agriculture for two years. Since 2009 the Slovak and Chinese Chambre of Commerce has provided the consulting and counselling service connected to trading. As a result of this development more and more business meetings are held between the managers of these two countries.

The students of the Chinese language at our university are divided into two groups – intermediate and beginners according to their level of proficiency. Knowing Chinese Mandarin is a gateway to immerse them into one of the oldest and most fascinating cultures in the world and to be able to understand its vast cultural heritage. It is very helpful when doing business with Chinese locals and it helps to build better relations with Chinese partners.

In our paper we will use the method of comparison.

Lewis (2006) states that the superior Chinese values are as following:

modesty,

tolerance,

filial piety, courtesy, thrift

patience, respect for elderly

sincerety, loyalty, family closeness, tradition

trustworthiness, stoicism, tenacity, self-sacrifice, kindness

moderation, patriotism, asceticism, diligence, harmony

resistance to corruption, learning, respect for hiererchy

generosity, adaptability, conscientiousness

sense of duty, pride (no losing face)

undemanding nature, friendship

gratitude for favour

impartiality, purity

wisdom.

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Confucianism has a strong influence on both the daily lives and business culture. The other factors which have impact on the behaviour of the Chinese are: Taoism with its insistence on a healthy lifestyle, vegetarianism and generousity of spirit, Buddhism emphasising harmony through meditation, Feng shui (wind and water) superstition, herbal medicine and acupuncture.

Lewis (2006) gives the characteristics of the Slovak values:

respect for education,
closeness to nature,
love of music and sport,
attachment to folklore, folk art,
defense of the Slovak nation and culture,
epicureanism,
rather religious (marriage, baptism, funerals),
attachment to popular traditions,
lack of self-confidence,
sense of historical victimization,
sensitivity to criticism.

2.1 Verbal communication

"The term verbal communication comes from the Latin word *verbum – a word* and means speaking, communication through words, language in which certain individuals have a common structure of knowledge" (Nagyová et al. 2012).

The official language in China is standard Chinese, which is derived from the Mandarin dialect. In this country with its numerous population people are speaking many different dialects. The Chinese perceive their language as a cultural tool that has the important impact on Japan, Korea and Southeast Asia and also as an instrument which served for the transmission of cultural values.

In the company culture in China seniority is valued bearing in mind that age brings seniority which means the older executive is the higher position he can take. Subordinates are expected to be told what to do. Consensus is generally highly appreciated in China. The Chinese are courteous and kind interlocutors. They usually do not contradict your opinion. If the Chinese speakers want to express any criticism, they do it indirectly.

Politeness is an interesting research theme in the study of intercultural communication, sociolinguistics, psychology, and pragmatics. Fundamentally, politeness is an expression of concern for the feelings of others. Different cultural and linguistic groups express politeness in different ways. The closest Chinese equivalent to the English word politeness is Limao.The word Limao is derived from the old Chinese word——Li. The classical notion of Li formulated by Confucius (551-479B.C.), whose influence remains strong to this day. Denigrating self and respecting others remain at the core of the modern concept of *Limao*. To the Chinese, businessmen's style of communication is the politest one. They often use positive commitment, recommendation and guarantee, however, they use threats, orders and warning remarks less. In their polite talking style, the most outstanding factor is that they usually do not use "No", "You" or facial gaze, but often maintain a moment of silence.

Lewis (2006) explains that in the speech of the Slovak managers there is a certain tendency toward vagueness, and the talk can often be ambiguous. This is because the participants of negotiations are non-confrontational and dislike saying anything that might offend the listener.

2.2 Nonverbal communication

"In this context it is interesting to mention usage and perception of the nonverbal symbols in accordance with the neurolinguistic programming. This theory originates from the basic premises related to the differenciated (i.e. conscious and subconscious) perception of the nonverbal signals and their complex, however, individual interpretation and the sujective

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perception in the contextual and situation relations“ (Klincková, 2011, Documents%20and%20Settings/User/My%20Documents/ Downloads/Neverbálna%20komunikácia.pdf).

Nonverbal communication means expressing ideas and feelings by facial expressions, gestures, movements, i.e. body language. Before entering any business negotiation it is advisable to acquire body language of your business partners, otherwise it can cause many misunderstandings.

We will show some typical Chinese examples of body language.

If you put your right hand on the position of the heart means it "sincere promise". Covering mouth with palm is the sign of self-satisfaction. Two hands joined express thankfulness and wishing good fortune. Touching hair means hesitation and confrontation with difficult problems. Touching cheek with the index finger is the sign that the person looks down on you, which is a kind of insulting gesture (http://www.ling.gu.se/~biljana/gestures2.html#dead).

The Slovak managers usually try to keep the eye contact with their business partners. It means that they are interested in them and the eye contact evokes trustworthiness. Crossed arms are the signs of defense and opposition. A palm covering mouth means a person wants to hide something, also uncertainty and embarrassment (http://www.ligsuniversity.sk/e-zin/rec-tela-aka-gesta-pouzivat-aby-ste-p-sobili-sebavedomo/).

2.3 Business negotiations

2.3.1 Space and time

In China the population density is low. However, the big cities are crowded. During conversation the Chinese keep the distance of more than one meter and they are extremely punctual, as they do not want to waste their business partners´ time. In China, it is a serious offense of business etiquette to be late and your hosts will be greatly annoyed.

The businesspeople in Slovakia try to have the distance within the social zone of 1.25 – 1.5 m from their counterparts. Good managers are always on time for meetings and negotiations. Slovaks and Czechs are considered to be more punctual than most Slavs.

2.3.2. Behaviour at meetings

1) It is necessary to make appoitments one or two weeks in advance with the Chinese officials. The Chinese prefer the formal business meetings, bearing in mind the formal business dress code. Conservative suits for men with subtle colors are the norm. Women should avoid high heels and short sleeved blouses. The Chinese frown on women who display too much. Subtle, neutral colors should be worn by both men and women (http://www.cyborlink.com/besite/china.htm).

2) Bowing or nodding is the common greeting; however, you may be offered a handshake. Wait for the Chinese to offer their hand first. At the beginning they will hand their business cards to anybody present in the room. Present and receive cards with both hands.When given a business card, do not stuff it into your pocket or wallet. Inspect it carefully and hold it along the edges in a respectful manner. Place it into a business card case or on the table in front of you. Introductions are formal and formal titles should be used. Seating is always hierarchical.

3) Lewis (2006) emphasizes that the senior man must be shown great respect and attention all times, even though he takes little part; the deputy or vice chairman is often the decision maker. The real decisions are not made during the meeting but elsewhere. The pace of negotiations is slow and politeness is observed at all times. Confrontation and loss of face must be avoided. A collective spirit prevails. Decisions have a long-term orientation. Negotiations in China are

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important social occasions during which one fosters relationships and decides if the people on the other side of the table are suitable partners for the long run. The Chinese dislike eagerness to sign a contract. They prefer mutual trust in the long term. In negotiating process, they avoid friction; put the friendship on the first consideration. What they want is permanent friendship and cooperation.

4) The Chinese do not use large hand movements. Most of Chinese do not like to speak with their hands.Your movements may be distracting to your host.

5) During the business dinners, when approaching the table, wait for your hosts to begin sitting; there is a hierarchical method to sitting. You will usually be seated on the right of your Chinese host, who will always serve you first. You should try all the delicacies from the table without leaving any dish empty. It can be surprising for the Slovak managers to hear their Chinese counterparts slurp and make all sorts of noises when eating. It is also advisable to try using chopsticks. Do not place your chopsticks on the bowl; this is considered bad luck. Also, do not stick them straight up in the food.

6) Bringing a gift is seen by the Chinese culture as an act of respect and gratefulness. Exchange of gifts between the companies should only be done after all negotiations are concluded. Here are some of the acceptable gifts: a fine pen except color red, a fine liquor or wine, solar calculators, eight of anything or food items. You also need to avoid giving gifts such as clocks; four of anything; scissors, knives or sharp objects; and gifts wrapped in black or white. Quality writing pens as considered favored gifts. The most acceptable gift is a banquet.

7) Chinese taboos involve egotism, loudness, arrogance, lack of consideration and any form of boasting. Regarding modesty as a virtue, the Chinese respect modest people, and dislike conceited and arrogant fellows. Therefore, over-stressing oneself might lead to the aversion of the Chinese when dealing with them.

“Be patient, everywhere and always!“ this is the most important advice when making deals with the Chinese partners. The Europeans try to finish everything as soon as possible, effectively, without any delays. They think that some minutes of tarriance can lead to the enormous loss. On arrival to China many Europeans lose patience if the contract is not signed at the second meeting, which is a serious mistake (http://www.manazerskecentrum.sk/clanok/ezisk-10-odporucani-na-obchodne-rokovanie-s-cinskym-partnerom.htm).

During the business meetings the Slovaks are normally polite and courteous and they wish to learn therefore they are attentive listeners. They rarely interrupt a foreigner and they admire daring and interesting conversationalists. Meetings in the Slovak companies are held in a rather formal manner, using the titles until people get to know each other well. The formal dress code is also required. In the seating arrangements hierarchy is respected. Slovaks usually follow Central European courtesies in diplomatic communication. They are tenacious in negotiating, but not forceful. A warm and personal approach is appreciated too. The typical gifts which can be appreciated are the presents with a company logo, expensive pens, a bottle of fine alcohol and business dinner.

3. Results and Discussion

The managers who want to be successful in foreign markets have to be aware of the local characteristics that affect the way business is done. The insight as to what to emphasize and what to avoid during the business interactions between the Chinese and Slovak managers can result in long-term and efficient cooperation based on the mutual respect and trustworthiness. The counterparts should take into consideration their partners` values, priorities, behaviour,

perception of time and space. It is also vital to become familiar with the principles of verbal and nonverbal communication of the business partners.

4. Conclusion

Our objective is to help Slovak and Chinese negotiators learn to work together more efficiently with mutual respect and gain the ultimate prizes. To move dealings to the next level, the Slovaks and Chinese need to understand the cultural contexts of Chinese and Slovak business styles. For Slovaks eager to do business in China, here is the last word: Move now, and learn the rules of the game by developing the relationship needed to grow your business there. Do not expect immediate results. Old friendships work their magic through time; every year invested in China now will pay off in the future — because in a world of millennia-old memories, relationships of the moment need long and patient nurturing.

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Quality assurance of agricultural university education in Russia and Europe

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Abstract
The article attempts to determine main assurance instruments of agricultural university education in the European Union and the Russian Federation. First of all authors compare significance of agriculture for economies and its productivity for last 10 years. As far as attending the sustainable agriculture is not possible without high qualified staff, agricultural universities have to provide economy with them. Russian and European approaches to the agricultural university education are different but have a lot of similarities. According to leading ratings authors chose top ten agrarian universities of Russia and Europe, analyzed their system of quality assurance. As a result there are five most popular instruments of quality assurance in agricultural university education of Russia and Europe: licensing; governmental accreditation; certification according to ISO 9001, ESG; rating among agricultural universities; public accreditation. In conclusion authors proposed to create an Agriculture Employers Union, aggregated organizations from different fields of agriculture. It can work out requirements for graduates of agricultural universities and accredit educational organizations. Level of employment assistance in agricultural universities, which would have this type of accreditation, could be the best guaranty of high quality of education.

Key words: *agricultural university education, quality management system, quality assurance.*

JEL Classification: *A209*

1. Introduction

Ensuring and improving quality of higher education and establishing quality assurance systems remains a high priority for many countries. (Eurydice, 2010) And the Russian Federation (RF) and the European union (EU) like two of major participants of the world economy are not exception.

Nowadays they are two biggest partners of each other. The European Union is by far Russia's biggest overall trade partner. And Russia is the European Union's third largest trade partner. (J.M. Barroso, 2013)

During last ten years agriculture did not play determined role in the economy of Russia and European countries, see figure 1. But it was and is still staying a fundamental sphere for quality of population living, food and ecological security.

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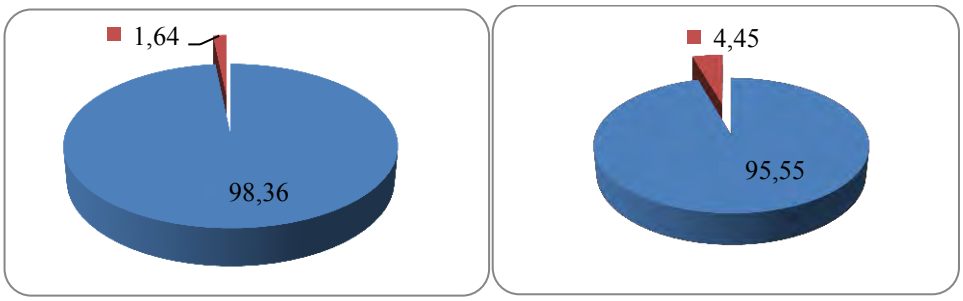
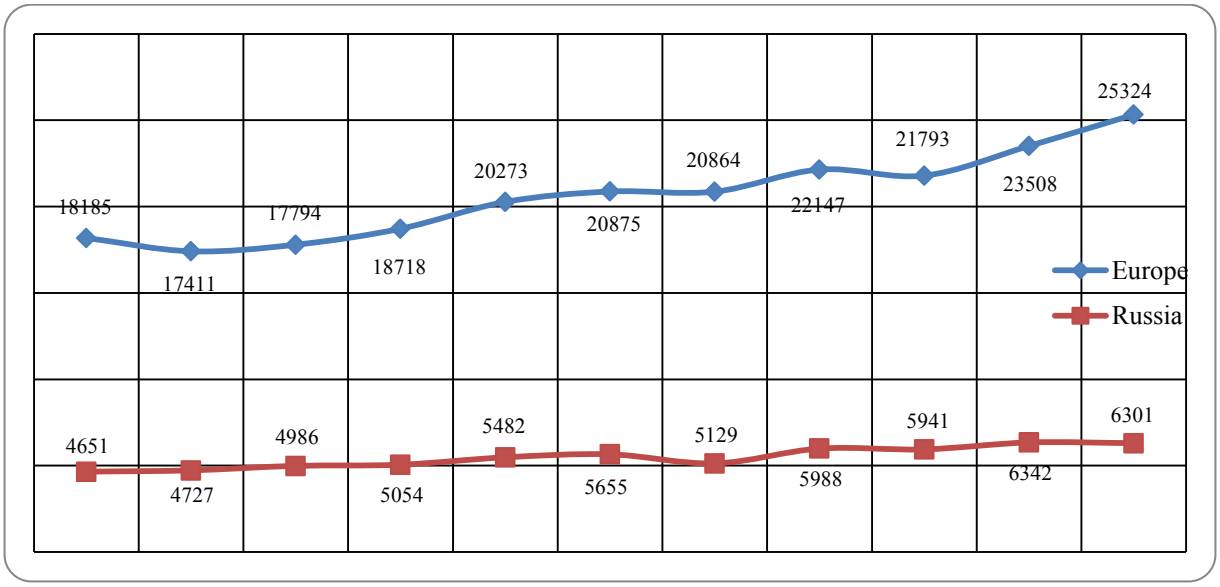
Figure 1: Agriculture, value added (% of GDP) in average for a period from 2004 till 2014 in the European Union (left picture) and in the Russian Federation (right picture).



Source: the World Bank Data.

Historically, few issues have attracted the attention of economists as has the role of agriculture in economic development and poverty reduction, generating an enormous literature of both theoretical and empirical studies. Much of this literature focuses on the process of structural transformation of economies, from the least developed in which economic activity is based largely on agriculture, to high-income countries where industry and services sectors dominate. (Cervantes-Godoy, D. and J. Dewbre, 2010)

Figure 2: Agriculture value added per worker (constant 2005 US$) in Europe (the European Union) and Russia for a period from 2004 till 2014.



Source: the World Bank Data.

Figure 2 reflects bigger productivity of agriculture (in average in 4 times) in Europe in comparing with Russia, in spite of a big difference (in average in 3 times) in % of GDP of agriculture, value added, where Russia's indicator is higher than Europe's one, see figure 3. It can be related with low efficiency of recourses using, big old machinery park and lack of high-qualified staff, which will be able to implement new managerial approaches and world best agricultural practices in Russia.

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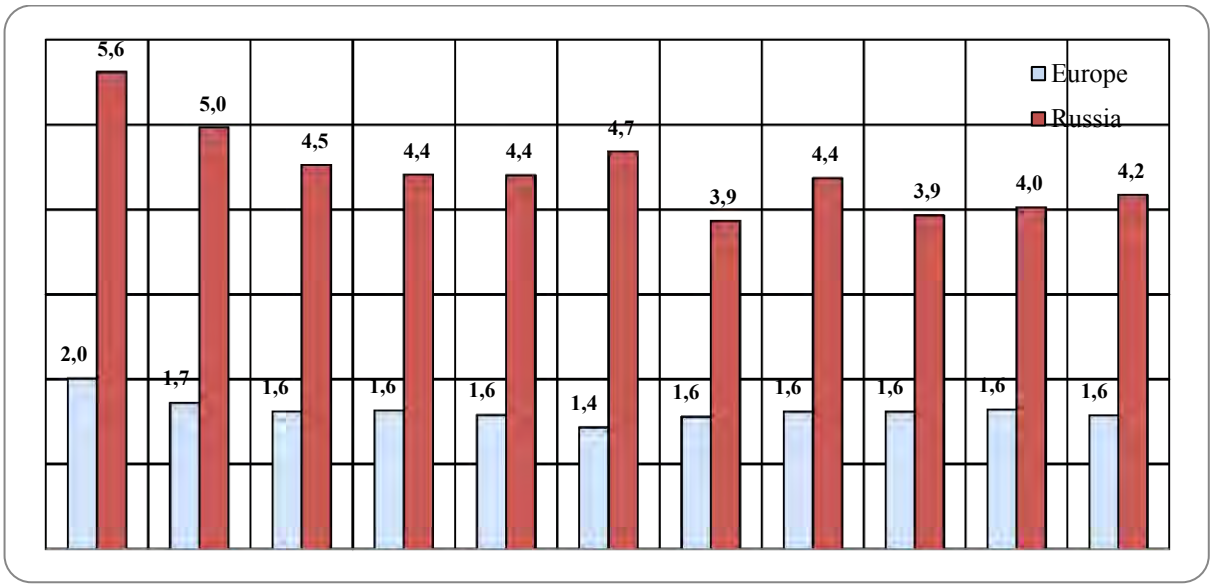
Figure 3: Agriculture, value added (% of GDP) in Europe (the European Union) and Russia for a period from 2004 till 2014.



Source: the World Bank Data

2. Agricultural university education analysis

Agricultural university education is one the most important instruments, which can provide economy with new specialists in agriculture on the one hand and renew specialists (in case of upgrade qualifications) on the other hand, who could face contemporary agricultural challenges. Let's review agricultural university education in Russia, see table 1.

Table 1: Indicators of agricultural university education in Russia.

	Quantity of agrarian universities	Quantity of students	University programmers	Governmental standards
Russia	59	429 200	192	22

As to "Quantity of agrarian universities" indicator in Russia, it includes: [7]

26 universities,

32 academies,

1 institute.

Universities have broad range of educational programmers, do fundamental and applied researches in different spheres of life. Academies specialize on one sphere of education, science and culture. Institutes research some spheres in additional to the education process, but are not leaders in scientific and methodological activity like universities and academies.

As to "Quantity of students" indicator in Russia, it consists of: [7]

197 800 students, who have intramural agricultural education and

231 400 students, who have extramural agricultural education.

As to "University programmers" indicator in Russia, it covers: [7]

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122 specialists programmers of high agricultural education and

70 bachelors and masters agricultural programmers.

Contemporary governmental standards of high agricultural education in Russia spell out next directions: [10]

for specialists 1 in animal science sphere,

for bachelors 10 in forest science, agro chemistry, agronomy, gardening, mariculture, industrial fishing, landscape gardening spheres etc.,

for masters 9 in spheres like for bachelors and 2 in animal science and veterinary and sanitary expertise spheres.

It is necessary to notice, that Russian and European educational systems are different. In 2003 the Russian Federation accepted the Bologna Accords, but the whole process of educational process changing is not completed. It seems, that these two educational systems will never be equal. But process of globalization goes on. More than that, one of the state policy principals in educational sphere of Russia is "creation of supportive environment for integration of educational system of the Russian Federation with educational system of other countries in conditions of equality and mutually beneficial relationship"[1].

3. Agricultural universities selection

For reviewing of quality assurance, which exists in universities of Russia and Europe, create lists of universities. On the Russian side chose 10 best agrarian universities according to the National Rating of Universities in Russia for 2014/2015 academic year, see table 2.

Table 2: List of 10 best agrarian universities according to National Rating of Universities in Russia for 2014/2015 academic year.

	Name of agricultural university in RF	Name of agricultural university in EU
1	Russian State Agrarian University - Moscow Agricultural Academy named after K.A. Timiryazev	Wageningen University
2	Stavropol State Agrarian University	University of Reading
3	Saratov State Agrarian University named after N.I. Vavilov	ETH Zurich - Swiss Federal Institute of Technology
4	Orel State Agrarian University	Agro, ParisTech
5	Altai State Agricultural University	University of Copenhagen
6	Saint-Petersburg State Agrarian University	University of Natural Resources and Applied Life Sciences Vienna
7	Omsk State Agrarian University named after P.A. Stolypin	The University of Nottingham
8	Bashkir State Agrarian University	Swedish University of Agricultural Sciences

[1] Federal law of the Russian Federation from 29.12.2012 #273-FZ (red. from 30.12.2015) "About education in the Russian Federation". Author's translation.

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9	Ural State Agricultural University	Ghent University
10	Novosibirsk State Agrarian University	Aarhus University

* Composed by authors according QS star rating Topuniversities and National rating of universities in Russia

National rating of universities is formed by non-state Russian information agency Interfax, which do it every academic year from 2009. Main criteria of estimation are educational activity, scientific research, social environment, international activity, brand, innovation and entrepreneurship of universities.

In 2014/2015 academic year Lomonosov Moscow State University stood on the first place with maximum grade 1000. Russian State Agrarian University - Moscow Agricultural Academy named after K.A. Timiryazev became first among agricultural universities for the same period. It stood on the 54-th place of common rating with the grade 509.

Difference in about 500 grades does not mean, that agricultural universities are twice worse that classical ones of non-sectorial education in Russia. It only means, that agricultural education differs from classical one. For example, it is more specialized, practical-oriented, has agricultural land in the material fund structure etc.

European Agricultural universities were evaluated according QS Stars rating were the following criteria, were selected into a key pillars:

- Research - indicators considered here include assessments of research quality amongst academics, productivity (i.e. number of papers published), citations (i.e. how recognized and referred to those papers are by other academics) and awards (e.g. Nobel Prizes or Fields Medals).
- Teaching - a key role of a university is the nurture of tomorrow's finest minds, inspiring the next generation of potential research academics. Typical indicators in teaching quality assessments are collation of student feedback through national student surveys, further study rate and student faculty ratio.
- Employability – graduate employability encompasses more than academic strength, focusing on ‘work-readiness’ - the ability to work effectively in a multi-cultural team, to deliver presentations, to manage people and projects. Common indicators in this area are surveys of employers, graduate employment rates and careers service support.
- Internationalization - here, effective indicators could be the proportion of international students and staff, the numbers of exchange students arriving and departing, the number of nationalities represented in the student body, the number and strength of international partnerships with other universities and the presence of religious facilities.
- Facilities - university infrastructure is an indicator which enables students to know what to expect from their university experience. Indicators such as sporting, IT, library and medical facilities, as well as the number of students societies are considered within this criterion.
- Online/Distance learning - this category looks at various indicators such as student services and technology, track record, student faculty engagement, student interaction, commitment to online and reputation of the university.
- Social Responsibility - engagement measures how seriously a university takes its obligations to society by investing in the local community as well as in charity

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work and disaster relief. It also analyses the regional human capital development and environmentally awareness.

- Innovation - innovation, the output of the universities activities and findings to economy, society and culture, has become increasingly relevant for universities.
- Arts & Culture - Effective indicators are the number of concerts and exhibitions organized by the institution, the number of credits and cultural awards and cultural investment.
- Inclusiveness - This area looks at the accessibility of the university to students, particularly at scholarships and bursaries, disability access, gender balance and low-income outreach.
- Specialist Criteria - Excellence in a narrow field is as valid a claim to world-class status as competence in the round. These criteria are designed to extend credit where it's due. This category looks at accreditations and discipline rankings.

4. Quality assurance of agricultural university education analysis

Analyzing quality assurance of agricultural university education, we can list main instruments, which are mostly used by agrarian universities of Russia and Europe, see table 3.

Table 3: Instruments of quality assurance in agricultural university education of Russia and Europe.

	Instruments	Status
1	Licensing	obligate in Russia
2	Governmental accreditation	obligate in Russia, in Europe
3	Certification according to ISO 9001, ESG	non-obligate in Russia, in Europe
4	Rating among agricultural universities	non-obligate in Russia, in Europe
5	Public accreditation	non-obligate in Russia, in Europe

* Composed by authors.

4.1 Licensing and governmental accreditation

Licensing is necessary for educational activity in Russia. Universities, including agrarian ones, must not work without governmental license. On the official web-site of The Federal Service For Supervision in Education and Science in Russia there is consolidated register of license, where every interested person can find this type of document of any educational organizations. Every agricultural universities of Russia, which we chose, place its license and certificate of governmental accreditation on the web-site. It is a state confirmation of high quality education for applicants, theirs parents, all students and even whole university stuff.

Governmental accreditation is the second essential instrument of quality assurance in university educational sphere of Russia and European Union. It consists of educational programmers checking according to governmental standards. Licensing and accreditation are periodically repeated events. There is no assurance, that after the next checking period a university obtains license or accreditation certificate.

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4.2 Certification according to ISO 9001

Certification according to ISO 9001:2015 and public accreditation are two non-obligate instruments of quality assurance in agricultural university education of Russia and EU. Since 2000s the certification process of quality management system became one of necessary aspects of every company success. Educational organizations of agriculture were not exception.

For confirmation of customer focus, process approach, continual improvement etc. analyzing universities certify theirs quality management systems according to ISO 9001:2008. New ISO 9001:2015 will change some directions of quality management building, for example:

- risk-based thinking instead of strict correction and corrective actions,

- "context of the organization" implementation, which means a set of impacting factors,

- documented information instead of documented procedures and records,

but the core of quality management system forming stays the same.

Most of agricultural universities all over the world have their own unique quality management system, some of them forms best education practices. As a result of this process there are certified quality management systems, governmental rewards in quality sphere, high reputation of university and, what is most important, big quantity of applicants and talented students.

At the European level Standards and guidelines for quality assurance in the European Higher Education Area (ESG) were adopted by the Ministers responsible for higher education in 2005. Given this changing context, in 2012 the Ministerial Communiqué invited the E4 Group (ENQA, ESU, EUA, EURASHE) in cooperation with Education International (EI), BUSINESSEUROPE and the European Quality Assurance Register for Higher Education (EQAR) to prepare an initial proposal for a revised ESG to improve their clarity, applicability and usefulness, including their scope. The focus of the ESG is on quality assurance related to learning and teaching in higher education, including the learning environment and relevant links to research and innovation. In addition institutions have policies and processes to ensure and improve the quality of their other activities, such as research and governance. The ESG apply to all higher education offered in the EHEA regardless of the mode of study or place of delivery. Thus, the ESG are also applicable to all higher education including transnational and cross-border provision. In this document the term programme refers to higher education in its broadest sense, including that which is not part of a programme leading to a formal degree. The ESG have the following purposes [7]:

-- They set a common framework for quality assurance systems for learning and teaching at European, national and institutional level;

-- They enable the assurance and improvement of quality of higher education in the European higher education area;

-- They support mutual trust, thus facilitating recognition and mobility within and across national borders;

-- They provide information on quality assurance in the EHEA.

4.3 Rating among agricultural universities

Another method of quality assurance of agricultural universities is to participate in different ratings among agricultural universities. There are a lot of ratings, which are formed by

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information and rating agencies, public companies, volunteers' organizations etc. But there is no universal system of estimation with one competent committee, which would specialize on agricultural university education.

5. Proposition

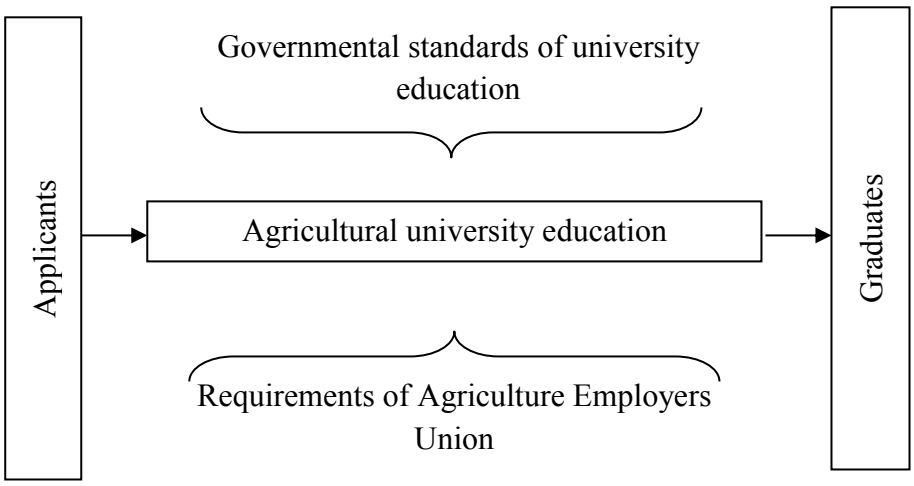
As to new, additional instruments of quality assurance we can examine public accreditation. It is not so popular in the agricultural universities' community. It's main goal is to determine, that graduates of the university satisfy labor market requirements.

In Russia and Europe there are some independent public employers' associations of such economy branches as engineering, tourism, entrepreneurship etc. For organizations of education there is the European Association for Quality Assurance in Higher Education (ENQA). It "promotes European co-operation in the field of quality assurance in higher education and disseminates information and expertise among its members and towards stakeholders in order to develop and share good practice and to foster the European dimension of quality assurance"[1].

Creation of Agriculture Employers Union would be great instrument for quality assurance of agricultural university education. Organizations in different main fields of agriculture can work out their requirements for graduates - future employees and check, accredit agricultural universities.

As a result universities get precise understanding about necessary skills set of graduates and improve their educational process. On the other side employers receive well-educated, practice-oriented staff. The draft of the union participation can be present on the scheme 4.

Figure 4: Scheme of Agriculture Employers Union's participation in the university education process.



Level of employment assistance in agricultural universities, which would have accreditation of Agricultural Employers Union, could be the best guaranty of high quality of education. This instrument can have advantages as for universities and students, as for agricultural organizations.

[1] Official web-site of the European Association for Quality Assurance in Higher Education (ENQA). Link: http://www.enqa.eu/.

6. Conclusion

In conclusion of the article it is necessary to underline, that in such different economies like Russian and European is agriculture is still staying a fundamental sphere for quality of population living, food and ecological security. Agricultural university education is the major aspect of sustainable development of agriculture.

There are four most popular instruments of quality assurance in agricultural university education of Russia and Europe: licensing, governmental accreditation, certification according to ISO 9001 and rating among agricultural universities. The public accreditation by Agriculture Employers Union was proposed in the article like a new instrument of university education improvement. In the process of accreditation universities get precise understanding about necessary skills set of graduates and employers receive high-qualified staff.

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The definition of energy intensity of living labour of the employee

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Abstract
The results of labour intensity calculations for a specific employee with the use of normative documents are presented. The indicators of average energy intensity of labour calculated for all categories of workers, depending on sex, age, body weight and physical activity ratio are presented.

Key words: *labour intensity, physiological energy norms, physical activity ratio, average energy intensity of labour, cost, price.*

JEL Classification: *J79, L51, O13, O15, Q19*

1. Introduction

Study of the problem of the value chain of food products is of strategic importance in providing the population with food. One of the main reasons for the high value of the products is the presence of price disparity in the markets of agricultural and fish products, raw materials and food, on the one hand, and material and technical resources - on the other. As a result, income from the sale of the final product is distributed disproportionately among the three spheres of its production - industry, agriculture and processing, as well as trade organizations.

In order to eliminate the disparity in prices as a criterion for us is invited to use the energy intensity of the production of goods. In our view, it is the amount of human energy spent on the production of commodities. And, on this basis, we determine the value of the amount of socially necessary human energy. And that's it (energy intensity) should determine the level of prices for all kinds of goods and services.

There is a problem of measuring the energy consumption of different types of labour workers. She solved using next normative documents.

According to the universal Declaration of human rights (1948) and the International Covenant on economic, social and cultural rights (1966), "the ideal of free human beings enjoying freedom from fear and want can only be implemented if there is a conditions whereby everyone may enjoy his economic, social and cultural rights, as well as their civil and political rights". Their effective implementation is necessary to observe the principle of equal pay for equal labour. However, the average wage level in rural areas is much lower than in other sectors of the economy, although the quantity and quality of labour is the same. This negative fact result in discrimination on a sectoral basis. For her (discrimination) eliminating us a method of energy analysis. Partially these issues were addressed by us in (Kasumov, 2014).

In our opinion, the labour is a conscious energy to create goods and is the basis of value and pricing. On the basis of equality of people, the socially necessary equal work should be paid equally regardless of industry sector worker. Therefore, the development of standards for the energy equivalent of 1 man-hour is an urgent task.

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2. Data and Methods

To determine the energy intensity (energy equivalent) of labour of various categories of workers we used the "Norms of physiological needs for energy and nutrients for different groups of population of the Russian Federation. Guidelines" (2008) and the obtained data are compared with materials GOST R 51750-2001. Method of determining energy consumption during the production of goods and rendering of services in technological energy systems (2001).

Total energy expenditure (ΣE_H) per day according to intensity can be divided into three parts: during sleep (E_S) (cost of energy at this time is equal to the value of basal metabolism (E_{VBM}), during personal time (E_{PT}) (very low physical activity, I group physical activity) and to labour (E_L):

$$\sum E_H = E_S + E_{PT} + E_L \quad (1)$$

$$E_S = \frac{E_{VBM}}{3} \quad (2)$$

$$E_{PT} = \frac{(E_{VBM} x 1.4) - E_S}{2} \quad (3)$$

$$E_L = (E_{VBM} x C_{PhA}) - E_S - E_{PT} \quad (4)$$

where, C_{PhA} - the coefficient of physical activity.

Using these formulas, we calculate the average values of the energy intensity of labour all categories of workers, depending on physical activity, body mass, gender and age. Note that the entire adult population, depending on the magnitude of energy expenditure is divided into 5 groups for men and 4 groups for women, taking into account the production of physical activity and other expenditure.

3. Results and Discussion

Normal text of the paper The result of the calculation according to the above procedure, we obtained the following values of energy intensity or the energy equivalent of labour between different types of workers depending on the ratio of physical activity. The unit is MJ/hour.

Group I (**very low physical activity; men and women**) workers mainly mental work, physical activity coefficient of **1.4** (civil servants of administrative organs and institutions, researchers, teachers of universities, colleges, secondary school teachers, students, medical professionals, psychologists, managers, operators including equipment maintenance of computers and computer software, programmers, employees of financial-economic, legal and administrative services, employees of design bureaus and divisions, advertising and information services, architects and engineers in industrial and civil construction, tax officers, employees of museums, archives, librarians, specialists, service, insurance, dealers, brokers, sales agents and procurement officials on social and pension funding, patent attorneys, graphic designers, travel Desk, reference services and other related activities).

Table 1. The average values of energy intensity of labour adult population for the I group physical activity (MJ/h), Men

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
50	0.405	0.382	0.357	0.329
55	0.424	0.399	0.377	0.346
60	0.444	0.419	0.394	0.363
65	0.466	0.438	0.413	0.380
70	0.488	0.461	0.432	0.399
75	0.511	0.480	0.452	0.419

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80	0.536	0.505	0.475	0.438
85	0.561	0.530	0.497	0.458
90	0.589	0.555	0.522	0.480

Table 2. The average values of energy intensity of labour adult population for the I group physical activity (MJ/h), Women

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
40	0.302	0.293	0.285	0.268
45	0.321	0.313	0.301	0.287
50	0.343	0.332	0.324	0.307
55	0.363	0.352	0.341	0.324
60	0.385	0.374	0.363	0.343
65	0.405	0.394	0.382	0.360
70	0.427	0.416	0.402	0.380
75	0.447	0.433	0.422	0.399
80	0.469	0.455	0.441	0.419

Group II (low physical activity; men and women) - workers engaged in light labour, the physical activity coefficient is **1.6** (drivers of urban transport, workers food processing, textile, garment, electronic industry, operators of pipelines, packers, drivers of railway transport, local doctors, surgeons, nurses, salespeople, employees of enterprises of public catering, hairdressers, workers housing and maintenance services, restorers of art products, guides, photographers, technicians and operators of radio and television broadcasting, customs inspector, workers police and highway patrol officers and other related activities).

Table 3. The average values of energy intensity of labour adult population for the II group physical activity (MJ/h), Men

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
50	0.556	0.526	0.491	0.453
55	0.583	0.549	0.518	0.476
60	0.610	0.576	0.541	0.499
65	0.641	0.602	0.568	0.522
70	0.672	0.633	0.595	0.549
75	0.702	0.660	0.622	0.576
80	0.737	0.695	0.652	0.603
85	0.771	0.729	0.683	0.629
90	0.810	0.764	0.718	0.660

Table 4. The average values of energy intensity of labour adult population for the II group physical activity (MJ/h), Women

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
40	0.414	0.403	0.391	0.368
45	0.441	0.430	0.414	0.395
50	0.472	0.457	0.445	0.422
55	0.499	0.484	0.468	0.445
60	0.530	0.514	0.499	0.472
65	0.556	0.541	0.526	0.495
70	0.587	0.572	0.553	0.522
75	0.614	0.595	0.580	0.549
80	0.645	0.626	0.606	0.576

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Group III (medium physical activity; men and women) - workers average weight of labour, the physical activity coefficient is **1.9** (machinists, operators, machine operators, drillers, drivers of electric vehicles, excavators, bulldozers and other heavy equipment, workers greenhouses, growers, gardeners, fisheries and other related activities).

Table 5. The average values of energy intensity of labour adult population for the III group physical activity (MJ/h), Men

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
50	0.784	0.741	0.692	0.638
55	0.822	0.773	0.730	0.671
60	0.860	0.811	0.763	0.703
65	0.903	0.849	0.800	0.735
70	0.946	0.892	0.838	0.773
75	0.990	0.930	0.876	0.811
80	1.038	0.979	0.919	0.849
85	1.087	1.028	0.963	0.887
90	1.141	1.076	1.011	0.930

Table 6. The average values of energy intensity of labour adult population for the III group physical activity (MJ/h), Women

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
40	0.584	0.568	0.552	0.519
45	0.622	0.606	0.584	0.557
50	0.665	0.644	0.627	0.595
55	0.703	0.681	0.660	0.627
60	0.746	0.725	0.703	0.665
65	0.784	0.763	0.741	0.698
70	0.827	0.806	0.779	0.735
75	0.865	0.838	0.817	0.773
80	0.909	0.881	0.854	0.811

Group IV (high physical activity; men and women) workers in heavy physical labour, the physical activity coefficient is **2.2** (construction workers, porters, working on maintenance of railway tracks and repair of roads, forestry, hunting and agriculture, woodworkers, athletes, blast furnace steelmakers-casters and other related activities);

Table 7. The average values of energy intensity of labour adult population for the IV group physical activity (MJ/h), Men

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
50	1.012	0.956	0.893	0.823
55	1.061	0.998	0.942	0.865
60	1.110	1.047	0.984	0.907
65	1.165	1.096	1.033	0.949
70	1.221	1.151	1.082	0.998
75	1.277	1.200	1.130	1.047
80	1.340	1.263	1.186	1.096
85	1.403	1.326	1.242	1.144
90	1.472	1.389	1.305	1.200

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Table 8. The average values of energy intensity of labour adult population for the IV group physical activity (MJ/h), Women

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
40	0.754	0.733	0.712	0.670
45	0.802	0.782	0.754	0.719
50	0.858	0.830	0.809	0.768
55	0.907	0.879	0.851	0.809
60	0.963	0.935	0.907	0.858
65	1.012	0.984	0.956	0.900
70	1.068	1.040	1.005	0.949
75	1.116	1.082	1.054	0.998
80	1.172	1.137	1.103	1.047

Group V (very high physical activity; men) workers particularly hard physical labour, the coefficient of physical activity - **2,5** (sportsmen of high qualification in the training period, machine operators and agricultural workers in the sowing and the harvest period, the miners and tunnellers, fellers, concrete workers, bricklayers, porters non-mechanized labour, herders and other related activities).

Table 9. The average values of energy intensity of labour adult population for the V group physical activity (MJ/h), Men

Body weight, kg	18-29 years	30-39 years	40-59 years	Over 60 years
50	1.239	1.171	1.094	1.009
55	1.299	1.222	1.154	1.060
60	1.359	1.282	1.205	1.111
65	1.428	1.342	1.265	1.163
70	1.496	1.410	1.325	1.222
75	1.564	1.470	1.385	1.282
80	1.641	1.547	1.453	1.342
85	1.718	1.624	1.522	1.402
90	1.804	1.701	1.598	1.470

4. Conclusion

The indicators were calculated on the basis of the state of [2] and can be used in the development of federal and municipal rules and regulations, as well as in the economic activity of enterprises, organizations and institutions of all forms of ownership.

The use of the average values of energy intensity of workers in economic practice, in our opinion, reduce social tension in labour relations, lead wages in line with the level of labour costs by sectors of the economy and individual industries, optimizing the structure of the economy and the proportional, the dynamic development of the real sector of economy.

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Mathematical competences as a part of educational objectives in economical and technical study programs

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Abstract
The main aim of this paper is to present mathematical competences as a part of educational objectives in the curricula of study programs focusing on economics and technics which are provided by the Slovak University of Agriculture in Nitra. There is a trend of reducing the number of hours of contact teaching and this leads to the search for more effective methods and forms of education. In particular, mathematical subjects give us opportunities to use new elements, which are based on the implementation of IT tools and e-learning, in the educational process. Especially the graphical interpretation of tasks via information technology improves the imagination of students, develops their creativity and increases their motivation to study mathematics and an application in mathematics. This involves updating of objectives of mathematical education at universities and modernization of teaching methods by using the information technology. In the economic and technical study programs, compulsory courses in mathematics are included in the first year of the bachelor degree and are completed by passing the exams. The assessment of the level of mathematical competences of students is possible by means of the final grades of their math tests. In this paper mathematical competences of students have been compared through final grades in winter and summer semesters in the period of several academic years.

Keywords: *mathematics competences, objectives of education, study programs, study outcomes, information technology, e-learning, mathematical software*

JEL Classification: *A23, C02, I21*

1. Introduction

The quality of higher education and the increasing competitiveness of universities are subject to continuous updating of the academic content as a result of interaction with the requirements for university graduates in the labour market. The content innovations should be in terms of the latest knowledge in the scientific field. Moreover, in today's information society it is necessary to combine attractive tools of information technology with traditional teaching forms in the process of education.

Semrádová et al. (2010) state that in the preparation of courses and learning materials in a virtual environment it is necessary to consider “why” and “what instruments” to use. An advantage of a virtual environment is the possibility of flexible options, instant updates, which are set in the didactic process and readily available for pupils and students.

The present educational research comes with the concept of synograph and its interesting possibilities of application. Markechová (2013) presents the linear 3-dimensional 2-parametric synograph as an illustration of the importance of highly precise input of information into multiple-choice (MC) test questions in order to avoid an ambiguity. Another interesting application of synographical approach is presented by Markechová and Stúpalová (2014).

The importance of mathematical education should be evaluated in terms of the application of mathematical methods as quantitative tools in various fields of human activities. Presentation

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and solving application tasks demonstrate the need to introduce new mathematical methods at faculties with economic and technical focus.

One of the important tasks of education should be an increase in students' motivation to learn. Based on the obtained results we can conclude that learning objectives are not clear to those students, who assume that their study subjects are not needed for their further education and professional application (Ferenczi Vaňová, Hornyák Gregáňová, Váryová & Košovská, 2014). Practical usage of exact procedures, samples of application of IT tools and presentation of abstract tasks in the form of research results is the best way of study (Nagyová, Berčík & Horská, 2014). The application of acquired knowledge can be used in many practical areas. In thesis and research projects students do statistical analyses, create various economic models, use a specification and a comparison of key elements, etc. (Mura, Grublova, Gecikova, & Kozelova, 2011). Problems of mathematical modelling curves in the plane and in space are complex and difficult; if you want to do this successfully, it is necessary to control complex mathematical apparatus, but in some cases it is quite difficult to understand them (Baraníková, 2014).

Not only students face the new requirements. University teachers and academic workers must also use modern IT tools and teaching methods. Present information technologies include an attractive and effective toolbox for educational process. Building a virtual learning environment, implementation of modern methods of e-learning and multimedia applications in education are influenced by the quality and attractiveness of an education provided at universities. In order to make teaching more effective, we need expertly trained teachers in IT; they do so by using computers and multimedia tools. The analysis of professional competencies of a lecturer in an adult education has been the subject of research of Žeravíková, Tirpáková and Markechová (2015).

Rating the quality of education is associated with the analysis of math knowledge and skills of students. The first aim of this contribution is to present actual mathematical topics in obligatory Math courses taught at the Department of Mathematics. The second aim is focused on the comparison of mathematical competences of students through learning outcomes and final exams in winter and summer semesters in years 2009 – 2014.

2. Data and Methods

The main material and data for processing of this contribution were gained during teaching compulsory Math courses at the Faculty of Economics and Management and at the Technical Faculty at the Slovak University of Agriculture (SUA) in Nitra. Additional material was obtained from the results of the research projects focused on the quality of mathematics education carried out by the members of the Department of Mathematics.

Comparative data were obtained in final tests of mathematical subjects in the first year of the bachelor degree study at SUA in Nitra:
- The Faculty of Economics and Management (FEM): Mathematics I (winter semester), Mathematics II (summer semester),
- The Technical Faculty (TF): Mathematics 1 (winter semester), Mathematics 2 (summer semester).

The final grades were made up of the sum of points from the study work during the semester (two mid-term written tests and a seminary project) and points from the final test.

In data processing, methods of descriptive statistics, analysis and comparison were used.

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3. Results and Discussion

At universities, the level of quality of teaching mathematics is constantly very important and discussed a lot. Many changes in higher education are related to the influx of large amounts of information from various areas that students have to take and handle during the study of theoretical basics and specialized subjects. New information sources are multiplying with the development and availability of information and communication technologies. This influence is connected with changes in the curriculum content, number of hours of contact teaching, demands for self-study and so on. Finally, these topics are reflected in the study outputs and exam results in mathematics.

3.1 The content of mathematical subjects at SUA in Nitra

Study results in mathematics are mostly influenced by students internal motivation, their attitude to mathematics and computer technology and moreover by their ability to use study and information resources. At the Slovak University of Agriculture in Nitra, the obligatory mathematical subjects include topics shown in Table 1. From these data it is evident that students in technical and economic study programs have the greatest range of topics.

Table 1: Topics in obligatory mathematics subjects

Topic	FEM	TF	FBFS	FESRD
Linear algebra	yes	yes	yes	yes
Function of one real variable	yes	yes	yes	yes
Limit of a function of one real variable	yes	yes	yes	yes
Differential calculus of a function of one real variable	yes	yes	yes	yes
Integral calculus of a function of one real variable	yes	yes	yes	yes
Function with two variables	yes	yes	no	no
Probability theory	yes	no	no	no
Infinite series	no	yes	no	no
Differential equations	no	yes	no	no

Explanatory notes: FEM - Faculty of Economics and Management, TF - Technical Faculty, FBFS: Faculty of Biotechnology and Food Sciences, FESRD: Faculty of European Studies and Regional Development.
Source: authors

3.2 The number of lessons of obligatory mathematics subjects at SUA in Nitra

In this section, we compare the number of lecture and seminar lessons in mathematical subjects after the accreditation of the faculty and the university, at first in 2009 and then in 2015.

Table 2: The number of contact teaching lessons per week after the accreditation in 2009

Faculty	Subject	Lectures	Seminars
FEM	Mathematics I (W)	2 lessons	2 lessons
FEM	Mathematics II (S)	2 lessons	2 lessons
TF	Mathematics 1 (W)	2 lessons	2 lessons
TF	Mathematics 2 (S)	2 lessons	2 lessons
FBFS	Mathematics (S)	1 lesson	3 lessons
FESRD	Mathematics (W)	1 lesson	3 lessons
HLEF	Mathematics (W)	1 lesson	3 lessons

Explanatory notes: HLEF - Horticulture and Landscape Engineering Faculty, W - winter term, S - summer term
Source: authors

In Table 2 are given data about mathematics subjects and a number of lessons after accreditation in 2009. Reduced number of lessons in contact teaching has had an impact on modification of

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the subject content and has led to leaving out some topics (e.g. analytic geometry, geometry in the plane or in space, shortening the theoretical part and others). In Table 2 the Mathematics, taught at the Horticulture and Landscape Engineering Faculty, has been registered. After the accreditation, the obligatory subject taught by the Department of Mathematics was cancelled.

Table 3: The number of contact teaching lessons per week after the accreditation in 2015

Faculty	Subject	Lectures	Seminars
FEM	Mathematics I A (W)	3 lessons	1 lessons
FEM	Mathematics II B (S)	3 lessons	1 lessons
TF	Mathematics for Technicians (S)	2 lessons	2 lessons
FBFS	Mathematics (S)	1 lesson	3 lessons
FESRD	Mathematics (W)	1 lesson	3 lessons

Source: authors

In 2015, after the accreditation, more changes occurred in the scope and content of the mathematical subjects (Tab. 3). At the Technical Faculty, one obligatory mathematical subject remained in the summer semester. At the Faculty of Economics and Management the proportion of the lectures and the seminars has changed into 3 lessons/1 lesson. The trend of reducing the number of lessons in contact teaching leads to the search for effective methods, forms and methods of education. A new way of contact teaching is aimed at the implementation of new methods based on e-learning and IT; an individual activity of students is necessary as well.

3.3 Results of classification in mathematical subjects

Exams and their results are one of the quantitative tools for measuring the quality of educational outputs.

Table 4 shows the summarized results of the tests in mathematics at the Faculty of Economics and Management. In terms of the quality of educational outcomes we can state that students have better average classification in the subject Mathematics II in the summer semester. We assume that it is due to the experience gained during the winter semester and students adaptation to the university system study. In the economic study programs the percentage of students who leave the faculty or the university without completing their studies is generally smaller.

Table 4: Classification of the results in Mathematics at the Faculty of Economics and Management

Academic year	Average classification Mathematics I	Rate Fail vs. Pass	Average classification Mathematics II	Rate Fail vs. Pass
2010/2011	2.19	0.006	2.16	0.016
2011/2012	2.24	0.003	2.05	0.006
2012/2013	2.34	0.200	2.20	0.015
2013/2014	2.24	0.014	2.23	0.008
2014/2015	2.31	0.027	2.36	0.039

Source: author's calculations

Table 5 shows the summarized results of the tests in mathematics at the Technical Faculty. It is evident that, within the observed period, students' achieved better average grades in the subject Mathematics 2 in the summer semester. The percentage of students who leave the faculty without completing their studies is higher compared to the FEM. This is related to the fact that the students are graduates from vocational schools, which are primarily focused on different

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skills and abilities of students than studying. In the first year, university students have a big problem to adapt to a different system of study and to handle theoretical basis of subjects.

Table 5: Classification of the results in Mathematics at the Technical Faculty

Academic year	Average classification Mathematics 1	Rate Fail vs. Pass	Average classification Mathematics 2	Rate Fail vs. Pass
2010/2011	2.39	0.12	2.49	0.05
2011/2012	2.25	0.15	2.54	0.09
2012/2013	2.51	0.21	2.48	0.13
2013/2014	2.57	0.10	2.48	0.27
2014/2015	2.47	0.10	2.41	0.04

Source: author's calculations

The trend of reducing the number of lessons in contact teaching is a new phenomenon at universities. Záhonová (2015) states that reforms in educational system have a considerable influence on mathematics knowledge of secondary school graduates. This situation has a negative effect on students' study results in Mathematics I at the Faculty of Mechanical Engineering at the Slovak University of Technology in Bratislava. Since the academic year 2008/09 she has been presenting the results of secondary school entry tests from mathematics and comparing them with their final results.

In 2006 – 2011, Mišútová and Mišút (2012) carried out joined research projects and presented the obtained results. The primary goal of these projects was to improve the quality and flexibility of mathematical education at the University of Technology by implementing the teaching models with the emphasis on an improvement of creativity and an information technology support.

4. Conclusion

The quality of education and abilities of students are evaluated mainly via exam results. The aim of this paper was to present the main facts which are associated with the quality of mathematical education at different faculties at the Slovak University of Agriculture in Nitra that prepare future economists, managers, entrepreneurs and technicians. In this context we have dealt with two thematic areas:

1. Mathematical topics in obligatory math subjects at SUA in Nitra.

2. The comparison of the level of mathematical competences of students through learning outcomes and the final test results in winter and summer semesters in 2009 – 2014.

The results of analysis of learning outcomes in Mathematics at SUA in Nitra confirm that in 2010 – 2015 there were no extreme differences in average grades of students in Mathematics.

Math teachers of future engineers (in the technical and economic fields) reflect on changes that have appeared in the educational environment. They face much higher requirements of mathematical knowledge on students now. The mentioned change is the subject of our research, where we are going to concentrate on the mathematical education of engineers (Országhová, Gregáňová & Matušek, 2013).

There are a lot of economic and technical branches where mathematical methods can be applied. This is the main educational goal and it is in accordance with updating of study literature in terms of applied problems and tasks (Pechočiak & Matušek, 2012). This kind of tasks supports

the improvement of the quality of math education and could increase students' study motivation.

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Neurodidactics and its utilization in the field of language teaching

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Abstract
Mastering one and more foreign languages is nowadays considered one of the key prerequisites in the life of every young person in order to obtain employment and to establish oneself as an expert in work. This task has to be fulfilled by schools, unless an individual has an opportunity to learn more languages in one´s native environment. Compulsory foreign language education depends on the given country circumstances. A traditional teaching model 'a teacher – a textbook – a student' is gradually replaced by some newer methods. Another interdiscipline was recorded in the field of education in the 1980s of the 20th century, which is known as neurodidactics. Neuropedagogy and neurodidactics are becoming more popularized nowadays and they are by many considered to be a revolution in education. Neuroscientific discoveries also mean a new view on education, personality of a learner, his or her motivation to learn foreign languages and to acquire foreign language competence.

Key words: *neurodidactics, foreign language, brain, stimulation of brain cells*

JEL Classification: *I23*

Introduction

Mastering one and more foreign languages is nowadays considered one of the key prerequisites in the life of every young person in order to obtain employment and to establish oneself as an expert in work. This task has to be fulfilled by schools unless an individual has an opportunity to learn more languages in one´s native environment. Compulsory foreign language education depends on the given country circumstances. It is an interesting fact that although Slovakia ranks among the developed countries, foreign language education was not, until recently, considered an important part of the curriculum. We can claim that less developed or even developing countries devoted much more attention to teaching foreign languages than we did. For example, English is compulsory in addition to the Arabic and French languages in the country of Tunisia, Spanish is a compulsory language in Morocco.Teaching English is taken for granted in the Asian countries of India, Nepal, Thailand, and many others. In the European countries, pupils are faced with compulsory teaching of foreign languages already during primary education. ”Therefore, almost all pupils who begin secondary education have the experience with learning at least one foreign language. Depending on the conditions in a given country, learning foreign languages can begin either in early childhood or it conversely becomes part of the curriculum in the last years of primary education. The participation rate of the primary education learners on learning foreign languages, which depends on the relevant learning content, can significantly vary in individual states. Thus, a certain percentage of pupils on the primary education level is not taught a foreign language in a given period (in this case in the year 2006) in some countries, although all primary education pupils learn one or more foreign languages at the end of primary education. [1].”

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Results and Discussion

There are many opinions on how to learn a foreign language, but especially a lot of the so called "guaranteed" expert advice. One of the pioneers who paid much attention to the issue of foreign language teaching was J. A. Comenius. It was the Latin language that he considered the basis for how to achieve education. According to his opinion, education without Latin was impossible. In 1631, he published two textbooks: Grammatica Latina, a Latin textbook and The Door of Languages Open (Janua linguarum reserata). Comenius recommended that learning a foreign language should be based on one´s mother tongue. We can say that teaching foreign languages is experiencing „a great boom" in our schools nowadays. There appear newer and newer textbooks in bookstores enriched with audio and video recordings, rich illustrations, but unfortunately, they often cost a lot of money. Many language schools offer a lot of their „guaranteed" efficient courses, crash courses aimed to achieve excellent foreign language competence in the shortest possible time. A traditional way of teaching "a teacher – a textbook – a student ' is gradually replaced by some newer methods such as:

- Learning in the Alpha Level – through stimulation of brain waves and the brain by means of the light and sound tones, thereby improving the ability to learn and remember,
- The Callan Method (introduced by an English founder - Robin Callan) – teaching English through conversation based on questions and answers,
- The "Genki" Method (a Japenese word that means “ fun”, “lively”, “energetic”) – is a fun way learning,
- E –learning - using the information technology,
- The Lozan Method - listening to music in the background with the subject matter in the theta state (suggestology),
- Direct Method – focuses on the narrative,
- Distance learning - based on the online instructions, it requires a strong motivation of the learner,
- And others, e.g. the Inlingua Method, LCF Clubs, Helen Doron, Berlitz method [2].

In the 80s of the 20th century, another interdiscipline was recorded in the field of education, which is called neurodidactics. This term was for the first time used in Gerhard Preiß´s work, who was a professor of the “mathematical didactics” at the College of Education in Freinburg. Since 1988, neurodidactics has been regarded as a relatively new scientific interdisciplinary field of study that combines research of brain and didactics. It also represents a certain kind of connection between neuroscience, educational science, didactics and psychology. It is connected with brain research findings and provides suggestions for effective learning and teaching, which is brain-based. The last research results in neurodidactics show that there is no singular and unique brain-based way of learning and teaching.

There are more definitions of the term “neurodidactics” in practice. “Neurodidactics is an art to organize and improve education on the basis of knowledge regarding the structure and functions of the brain, sensory preferences, differences of the cerebral hemispheres, learning styles, suitable reactions responding to stressful situations and different kinds of memory. It combines and links various aspects of traditional teaching from the new perspectives. It focuses on education, a personality of a learner and his or her motivation to learn. It is a science in the sense of organizing the educational process, using the latest knowledge about the human brain” [3].

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According to the online Wörterbuch Dictionary, neurodidactics monitors the development of educational and pedagogical plans with regard to the important findings from the field of neuroscience, in particular to the more recent brain research. It uses neurobiological and psychological knowledge in education and by means of examining the brain it provides the information on what is happening in the brain and how one learns. [4].

According to W. Lehman, "neurodidactics combines didactic or eventually pedagogical - psychological concepts with modern knowledge of neuroscience and especially with more recent research of the brain" [5].

While neuroscience in didactics was not sufficiently explored in the past, neuroscientific knowledge plays a significant role in the educational field in the 21st century. Neuropedagogy and neurodidactics are becoming more popularized nowadays and they are by many considered to be a revolution in education. They give priority to organizing the educational process using the latest knowledge about the human brain. Neurophysiological findings became the subject of many neurodidactic papers and the areas dealing with brain research knowledge are also widely used in the sector of language education. Discoveries in the field of neuroscience also mean a new view on education, on a learner personality and his or her motivation to learn foreign languages in order to acquire a foreign language competence. One of the basic requirements of neurodidactics is an individual talent. Based on the discovered capability of an individual, we can develop his or her personality, broaden the horizons of his or her knowledge. On the website of the Neurolinguistics Magazine, multipolyglot, 64- year-old Leo Anders currently offers a multimedia program called *Ling Fluent* for learning foreign languages. It guarantees a 4 -week language learning flash method based on the current use of both hemispheres of the brain, thereby improving the memorization process [6].

The left hemisphere is the center of analytical thinking, speech and logic. The right hemisphere is responsible for our synthetic thinking. It reflects our creativity and imagination. Using it, we are able to perceive colors, pictures, music and rhythm. It is the seat of our emotions. By stimulating the brain cells, it comes to positive changes and development of the neural networks of the brain. The left and right brain hemispheres paralely work while learning new words. Verbal speech is heading into the left hemisphere, while the picture accompanying it is heading into the right one.

Left Hemisphere		**Right Hemisphere**
Analytical thinking		**Holistic thinking**
logic		emotions
numbers		music
language		phantasy
will		taste
facts		creativity
science		intuition
weights, measures		rhythm

Pictrure: http://www.totaltraining.sk/index.php/clanky/detailnejsi-zoznam/9-hemisfery

If several senses are simultaneously used during foreign language teaching, certain linguistic schemes are developed in the brain, which accelerates the process of remembering and prevents

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forgetting the vocabulary. Vocabulary is installed in the brain and is automatically and naturally used in speaking. The correct choice of textbooks is equally important so that especially both perception channels - ear and eye - are involved in learning. Therefore, it should not be forgotten about good acoustics and lighting in classrooms, print quality of the teaching materials and high-quality recordings without any side noise in the listening texts.

In learning, it comes to firm connection between neurons (neuronal cells) and formation of the neural networks. Each neuron has a number of nerve fibers at the end of which the so-called synapses are found. They transmit impulses and information to the other synapses and hence to the neurons. The impulses and information are accepted more slowly with the increasing age. A learner may indeed learn a lot but the information is not processed that quickly. It takes longer to store the information in one's memory, which slows down the entire process of learning [7].

Emotions are also important in the process of learning. The middle part of the brain is considered the center of emotions. Our memory and motivation are interrelated with emotions. It is sometimes interesting that we do remember our most positive and negative situations of our life and, in the contrary, we don´t remember our emotionally less significant situations. Many language teachers consider emotions a kind of the key to helping language learners learn new languages. They color our lives, strengthen our memories and they also function as strong motivators. The last findings have shown that emotions are a particular driving force in stimulating learning.

The progress in mastering the language acquisition is individual. No brain is able to process the information immediately. Every mind influenced by one´s own experience and anatomic peculiarities processes and evaluates the information in a different way. The question is: How do we perceive the world and how do we interpret our perceptions? We know from the testimonies of people who speak more foreign languages that the hardest part was to learn the first foreign language. The more languages they mastered, the more easily they were able to learn other languages. If we don´t master the second language well, besides the mother tongue, or if we don´t learn it easily, the particular brain centers will be best activated when we speak or read more in the second language.

The latest neuroscientific as well as psychological findings provide us with more information on how we learn. There isn´t any unique way of learning, not even in learning foreign languages. Each learner has his or her personal style or form to learn. If we were able to recognize how our brain learns, to understand the mechanism of learning, it would be very beneficial in order to improve the teaching and learning process. Many performed researches have shown and highlighted the existing neuro-functional networks that are only specialized in processing some special language aspects during the process of language acquisition.

Are Older People Able to Master a Foreign Language?

There are many suggested ways dealing with how to prevent some premature sclerotic changes in the brain. One of the best brain trainings is considered learning a foreign language. Until recently, learning foreign languages was especially considered a privilege of the young generation, but an increasing interest of older people has been recorded in the last years. A seventy-year old person, active and eager to learn, can often master a foreign language more successfully than a less ambitious twenty-year old learner. Thus, an age is only one of many and less relevant variables such as, for example, learning experience, experience with teaching the language and motivation. However, there are also some aspects teachers should be conscious about in their teaching. While many young people have their own strategies in learning foreign languages, middle aged people dispose of a rich base of knowledge and experience they can rely on while learning. They prefer cognitive learning, they are more

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flexible in communication. A strong motivation is often considered a priority of the middle-aged people, which is mostly based on one´s job retention and career promotion. The advantage of the older people, the retirees, is that they have enough time. They are hard-working, intensively prepared and they have the sense of responsibility. While many young people use the grammar knowledge, a fun-form tuition is recommended in older learners. The progress is slower, frequent repetition is important in order to affirm the already acquired competences. Older people prefer the literal text translation while practicing the reading comprehension skill. Despite the wealth of knowledge and experience, communicative methods cause problems to them and it is necessary to leave them sufficient time space in this specific part of the course tuition. The principle of small steps is applied here, the language is taught concurrently with grammar and translation. It is also important to bear in mind that each individual has his or her own style and individual approach to learning.

Our brain is supposed to be neuroplastic, which is caused by one of the brain features that it is constantly readjusting to new conditions, especially to environment. Every human being can keep learning during his or her whole life. The difference between children and adults is that the speed of learning is very high in children, while it is not the case in older people. On the contrary, they can learn through their analogical thinking, which is not so developed in children.

Conclusion

We place the greatest emphasis on the ability to communicate in teaching foreign languages in order to make oneself understandable and to meaningfully communicate in a foreign language. In this respect it is important that teachers are the acceptable language models for their students through their expertise, combining the teaching methods and authenticity of teaching materials. If a teacher does not have sufficient foreign language certainty and is not able to be of fluent target language communication, then he/she cannot relevantly enter into the tuition and substantially motivate his/her students. On the other hand, it is necessary to take peculiarities and particularities of the learners into account. What are their linguistic, motivational and relationship - attitudinal goals? What is their relationship to a foreign language, to culture of a particular country? What is his or her age, self-assurance, intelligence and intellectual givenness? All these important aspects are considered the basis for mutual success of teachers and learners.

Neuroscientific research has gained a lot of attention in the last few years in many countries of the world. A new model called “neurodidactics” has been introduced. Neurodidactically oriented researchers keep saying they want to help the teachers to realize the so called „brain-adequate learning“. They also claim that an emotional basis is the core of the learning process. Many questions regarding neurodidactics and neuroscience have remained open. Neuroscientists can see for example the neuronal foundations of the learning process, but they cannot see the entire complexity of the tasks teachers have to solve every day. The future of teaching and learning foreign languages, not excluding the relations between teachers and students, is full of questions.

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Thought leadership as an innovative way of teaching

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Abstract
Thought leadership is a relatively new method of teaching, which is closely linked with the critical and synthetic thinking, which is required for the creation of expert strategies and visions of thought leadership in the given area. It is considered to be a pedagogical approach oriented on the student, including learning, solving of problems and making of decisions based on questioning, investigating, exploring, searching, discovering and with that related abilities. Students have the task to synthesize the data and information from various sources (primary or secondary research) with the aim to develop a strategic view of the solved problem. The teacher determines that range of topics that the student could demonstrate his critical thinking and ability to assess and evaluate the information. The main aim of the present paper is to highlight the importance of the method of Thought leadership and synthesis of information in the teaching process of subjects in the study program of Business Entrepreneurship, its practical application in the solution of specific tasks given by the teacher, to assess the survey conducted by students, to handle the strengths and weaknesses of innovative teaching methods based on the opinions of students and teachers and to recommend proposals for its efficient use.

Keywords: *Thought Leadership, synthesis of information, innovative teaching method, critical and synthetic thinking*

JEL Classification: *I20 I29*

1. Introduction

The main task of university education is to train highly skilled specialists, who will be able to assess market situations correctly and make independent decisions, particularly under complicated and uncertain economic conditions. In this context, an important issue is the development of leadership skills of future managers, marketers, etc. To have positive results in this respect, a special training and a quite long period of time are required. Students should have a certain "base", which could help them to advance these special skills and the ability to make their own decisions and to become real professionals in their fields.

Thus, higher education is an important cornerstone, which can provide good opportunities for students to develop problem-solving and independent thinking skills. Giving the importance of this issue, the Faculty of Economics and Management of Slovak University of Agriculture launched a pilot project for the introduction of innovative teaching methods in the framework of the study program of Business Entrepreneurship in the exercises of two selected objects. Particular attention is paid to issues of adaptation of students to such methods, first of all, to the so-called Thought leadership approach. Its various aspects are investigated in order to better understand possibilities for students to improve their leadership abilities and creative thinking, based on this method.

The role of leadership in education and special approaches and methods are discussed in a number of publications. For instance, Burkhardt (2002) argues that the adaptive capacity of higher education is not only rooted in the ability for institutions to change one by one, but in a

systems level capability which depends upon a specific form of leadership. He has the point of view that this leadership process is constructed at the boundary between higher education at large and its interface with society.

Briggs and Raine (2013) state that leadership is best learned not by being "taught" in a traditional classroom context, but by exploration of and reflection on practical experiences and through developing the ability to "internalize" the behavioral processes involved, both positive and negative. They also argue that an approach is needed which offers students opportunities to learn not only through the imparting of theoretical perspectives on the subject but also by impacting upon their self-awareness as a result of a focus on experience of leadership in practice (e.g. the action learning approach).

According to Male and Palaiologou (2015), it is necessary to shift from using models of leadership and instead to view leadership as a praxis that is not merely concerned with the dichotomy of teaching, learning and outcomes, but is also concerned with an integrated conceptualization of the relations between teaching, the learning ecology of the community and the social set of axes in which the educational organization is set. This understanding of pedagogical leadership is thus concerned with the links between desired educational outcomes and the set of social realities that surround the educational setting.

Haber-Curran and Tillapaugh (2015) emphasize the use of student-centered transformative learning which is based on the five-stage model: (1) challenging mental models of learning, (2) building trust, (3) finding freedom and empowerment, (4) deepening commitment to learning and (5) reframing learning and self. Students participating in this experience demonstrated significant development in their relationship to learning. Additionally, the students' approach to learning changed throughout the course, shifting from dependence/independence toward interdependence.

Eich (2008) proposes the theory of high-quality leadership programs, which is grounded in programmatic attributes that, when enacted, contribute significantly to enhancing student learning and leadership development. 16 attributes of high-quality leadership programs should be organized into three clusters: (a) participants engaged in building and sustaining a learning community; (b) student-centered experiential learning experiences; and (c) research-grounded continuous program development. This model can guide the design of programs and participants' learning by helping participants grow through self-discovery, personal development, and collaborative leadership with others.

Regarding teaching leadership practice, Yip and Raelin (2011) identified two threshold concepts that had a transformational impact on students: (1) situational leadership and (2) shared leadership. In addition, they found three modalities that supported the learning of threshold concepts: (1) variation, (2) enactment, and (3) reflection.

Another interesting pedagogical technique is the live in-class CEO intervention method. According to Rashford and de Figueiredo (2011), this method consists of a CEO bringing to the classroom a strategic issue that she or he is currently struggling with and addressing it real time with a team of students. In their opinion, this method is helpful in the development of a leadership skill-set. They argue that a by-product of participation in several of these interventions is an expanded ability to engage in systemic thinking and bridge theory and application in an open way.

Powley and Taylor (2014) consider development of critical thinking and crisis leadership based on specific pedagogical methods. They concentrate on two approaches, each designed for critical thinking skill development, to teach graduate management students about leading in and through potential disruption to organizational life:

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- a personalized case method that relies on a critical incident approach to examine crises students personally experienced at work;
- a group project involving a poster session in which students collaboratively work on complex crisis leadership challenges and present their analysis to their peers.

Houghton et al. (2012) developed a model of the relationships among emotional intelligence, self-leadership, and stress coping among management students. The model suggests that effective emotion regulation and self-leadership, as mediated through positive affect and self-efficacy, has the potential to facilitate stress coping among students. It has the potential to generalize to the workplace, management students exposed to emotion regulation and self-leadership strategies may be better equipped to effectively manage stress in their future careers.

Rost and Barker (2000) pay attention to the social aspect of leadership education. From their point of view, this education is aimed at producing citizens for a democratic society. They claim that its content in the future will cover three broad categories − the evolution of social change and development, the processes that influence social development, and the dynamics of human nature in change processes.

By that, that Brosseau (2014) characterizes the thought leader as someone who has the ability to inspire others for a new idea, to change the way how the things were done in the past and to establish a new approach or behaviour, he has set the bar a little higher than it was in the case of the normal concept of expert leader, just because he has a higher education and he is more frequently quoted in newspapers as his colleagues. However, the real thought leadership is that the leader has original ideas and he leads people anywhere and not only that, he is better known than the others. Anyone can become a thought leader, although only few people are able to come up with breakthrough ideas. Almost everyone can bring forward his ideas to the world, affect it in matters in which he cares, and leave a meaningful legacy, on which he can be proud. Brosseau (2014), in relation to the mentioned, provides a 7-step model:

1. Find out what is your driving force, which thing interests you more than anything else. Define, which area it is, where is your floor, what will your benefit and in what you want to be known as an "authority".
2. Create your "circles of influence"; talk with those people who have to say something to your thoughts. These interviews will help you to refined over the time your message and to tell a broader story which will appeal to your first followers.
3. Create a group of people who will spread your thoughts below. You need also the people from the outside of your immediate territory, who are confident about your thoughts and are willing to speak about them with others, or they have some experiences with them. You need to find out, what you can offer them, to spread your thoughts, and how to sidestep your potential opponents.
4. Cancel you own limitations. If you want to promote your idea, find out what limits you in the maximum efficiency, and then removed it. In many cases it means to deal with the fear of failure or of public embarrassment.
5. Codificate that, what others have to know. The main difference between the leader and the thought leader lays in the ability to move from his know-how to a mental model, which can be passed on to others so that it will inspire them and build in them the taste to follow.
6. Start your tom-toms. You need it to do some promotion about your idea, so that other will know about you and your idea. You need to be known. Leader, who is not known, is not a leader. You need to be discovered, still discoverable and again discovered by people to whom is your idea close and are following.

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7. Start the (r)evolution. When your thoughts are accepted, you need to learn how to monitor their success and to build for them new and new opportunities for exposition.

Young (2013) has conducted a survey in the area of thought leadership – she has followed its roots until the Industrial Revolution, investigated the sources (including "recycled" ideas) and the essential components (e.g. that it is freely shared), as well as analyzed, how the ideas are spread and what mechanisms are used to transform it into a process within the organization.

2. Data and Methods

The main aim of the present paper is to highlight the importance of the method of Thought leadership and synthesis of information in the teaching process of subjects in the study program of Business Entrepreneurship, its practical application in the solution of specific tasks given by the teacher, to assess the survey conducted by students, to handle the strengths and weaknesses of innovative teaching methods based on the opinions of students and teachers and to recommend proposals for its efficient use.

The secondary data, for the processing of the present paper, were drawn from the available literature sources of domestic and foreign authors dealing with the issues of thought leadership, as well as from the materials developed under the National project of the Universities as the Engines of Knowledge Society. To the questionnaire survey aimed at testing of the method of Thought leadership realized in the segment of students of the study program Business Entrepreneurship at the first level of study at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra, were involved 28 respondents, who were actively involved the testing of mentioned method in the winter semester of the academic year 2015-2016.

The primary data obtained through the questionnaire survey were processed out in absolute and relative terms.

3. Results and Discussion

Through non-material means, such as the course content, methods and forms, and material means, in the teaching there comes to the process of self-creation and development of student's personality, which consists of the following processes:

- acquirement of knowledge leading to the acquisition of knowledge,
- acquirement of experience from realization of activities, which also lead to the knowledge, but mainly to the acquisition and development of skills and habits,
- acquirement of experience from creative activities leading to the acquisition and development of abilities and interests,
- shaping of attitudes, beliefs and values.

The process of creation of the student's personality starts with the received external quality, which is reflected in the knowledge, skills and habits, continues with the internally transformed quality, inherent in the abilities and interests, to internally shaped quality, which results into the character, volitional, emotional value and personality traits. The learning rescue is the experiencing of the relationship between the people, in which the teacher allows the students to find out in them an inner disposition to self-creation and development of their personality and self-education.

Educators from the Department of Marketing and Trade use those kinds of education, which activate the personal growth of students. They lead them to self-regulation, allow them the self-realization in order to learn them to manage themselves and their own lives. One way

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how to help the students in the development of their personality is to create that kind of relationship, in which they will appreciate themselves. A relationship, in which the teacher on the basis of empathy understands and judges the students experiential experience, and in which he gives them a freedom in experiencing their own emotions and the emotions of others without endangering them.

In the study programs Business Entrepreneurship (the 1. stage of study) and Agrarian trade and marketing (the 2. level of study) taught at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra, are in teaching of accredited subjects currently used different methods (Table 1).

Table 1: Methods used in the education of accredited subjects in the study programs of Business Entrepreneurship and Agrarian trade and marketing

No.	Method	Description of the method	Application in the practice
1.	Collaboration of businesses in supervising of student´s seminary, bachelor and engineer theses.	Company employees act as the principals of themes of work, they have an interest on their leadership, review or assessment.	The method is carried out in cooperation with the wholesale Metro Nitra, hypermarket Tesco Nitra, shopping − entertainment centre Galéria Mlyny Nitra, Agrokomplex − Exhibitions Nitra and others.
2.	Excursions in enterprises.	Visits to companies associated with professional lectures of TOP managers.	The method is applied in conjunction with the wholesale Metro Nitra, hypermarket Tesco Nitra, shopping − entertainment centre Galéria Mlyny Nitra, companies of food industry − Víno Matyšák, Hubert J. E., Ltd. Sereď, Bryndziareň a syráreň, s.r.o., Zvolenská Slatina, Agrokomplex − Exhibitions Nitra and others.
3.	Teaching by professionals from the practice.	Prominent experts from the cooperating businesses are providing the lectures and seminars.	The method is applied in cooperation with the wholesale Metro Nitra, hypermarket Tesco Nitra, shopping − entertainment centre Galéria Mlyny Nitra, leading specialist working in ministries, research institutes, the Slovak Agricultural and Food Chamber, farmers, directors of enterprises and others.
4.	Individual assignment for students in the form of projects.	Solving the problems in the form of projects, where the students are forced to seek for the information independently and consequently to offer custom solutions, to comply with the deadline for the project preparation, to present the project in front of the teacher and the sponsor of the project.	The method is applied in conjunction with the shopping − entertainment centre Galéria Mlyny Nitra, Agrokomplex − Exhibitions Nitra, Ing. A. Belaj, PhD., who presents the themes of projects entered by Czech and Slovak companies, while the sponsors of the projects are participating on the evaluation and selection of the best works.
5.	Team student projects.	Teams are working together on the projects, schedules of	The method is applied in conjunction with the shopping −

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		the teamwork are flexible; teamwork can be short-term, but also throughout the whole semester.	entertainment centre Galéria Mlyny Nitra, Agrokomplex − Exhibitions Nitra, in cooperation with Ing. A. Belaj, PhD., who presents the themes of projects for Czech and Slovak companies and others.
6.	Working with model assignments (Case studies).	Depending on the aims, the objective may be the analysis of knowledge or skills, or even knowledge and skills.	The method is applied in the teaching of several subjects. Case studies are prepared by teams of teachers in printed form in Slovak and English language (since almost all subjects taught at the department are taught in English) on the basis of real patterns of practice – e.g. Austrian company Zotter, producing handmade chocolates, farms producing organic pork, Fair Trade – coffee and many more.
7.	Real projects with businesses (Live Projects).	Live Projects are extensive and demanding. Companies are focusing on a variety of issues − from the design of new products, through new domestic and foreign markets, adapting of products to overseas markets, packaging design, and so on. They may be time limited, or they are missing expertise. Students, either as individuals or as members of teams, in the development of the project in the short term use their knowledge, consultation with teachers and practitioners.	The method is applied in the teaching of the subject International Marketing.
8.	Functional role play or simulation.	Role plays and simulations are created and managed by teachers so that they meet specific learning objectives, they approach facts, while the student remains in the educational environment. Students took on the task and play their roles under certain scenarios. Role playing allows students to experience real skills, so that they will take a special role in cooperation with other students. The simulation of actual work situation allows students to experiment and improve their understanding of theories of negotiation and	The method is used in the teaching of the subject Managerial Communication.

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		related topics.	
9.	Strengthening of foreign language skills.	Ability to master at least one foreign language is for almost all employers a clear condition.	Students during the 3-year bachelor study (Business Entrepreneurship) undergo the compulsory teaching of two foreign languages at the Department of Languages by state examination UNICERT. Their language skills are developed by writing their final works, seminary works and projects. Students can develop their language training throughout their whole study through courses organized by teachers from the Department of Languages. To enhance the knowledge of the language is also possible by teaching vocational subjects in a foreign language, but also through projects realized by foreign colleges and universities, or practice in selected foreign companies, since the Slovak University of Agriculture in Nitra has official contacts with more than 100 colleges, universities, research institutions and foreign enterprises.

Source: Material for the Etape no.1.1.6: *Metodika pre inováciu: Myšlienkové vodcovstvo a syntéza informácií*. 2015. 18 s.; Material for the Etape no.1.1.6: *Štruktúra popisu implementácie inovatívnej metódy vzdelávania*. 2015. 5 s.; own processing of.

3.1 Method of Thought leadership and synthesis of information

This method was for the first time used in the exercises of the subjects of Global Marketing and Retailing and Merchandising. The main objective of its application was to maximize the student´s involvement in solving tasks during exercise, to develop their independence, creative thinking and the ability to bring the given tasks to the end.

In applying the method, there was ensured not just the participation of the teachers of both subjects, but also of an external foreign teacher, as relevant subject expert. The expected benefit of such alternative is that the experts can guide the students after their presentations, clarify or supplement the information necessary to submit a detailed analysis of trends or situations in terms of professional knowledge of solved issues. By making students aware of the participation of experts in the exercises, it is expected that they will be more responsible and better prepared to handle the assignment, but also to prepare their presentation. Such access, as well as the participation of local and foreign experts in teaching is expected not only the quality preparation and presentation of the students, but also the high quality of provided supplement information on the solved problems after the presentation and rich discussion with students. The success of this method is associated with such competence, such as expertise, intellect, information management, problem solving, adaptability, creation of new, organization, communication and master stroke − the ability to make the right choice. The potential of the method is a broad spectrum, that means that it can be used also for the development of other responsibilities in consideration of the variety of options which it offers. When applying this method it is necessary to provide a work in small teams, or assign tasks to individuals.

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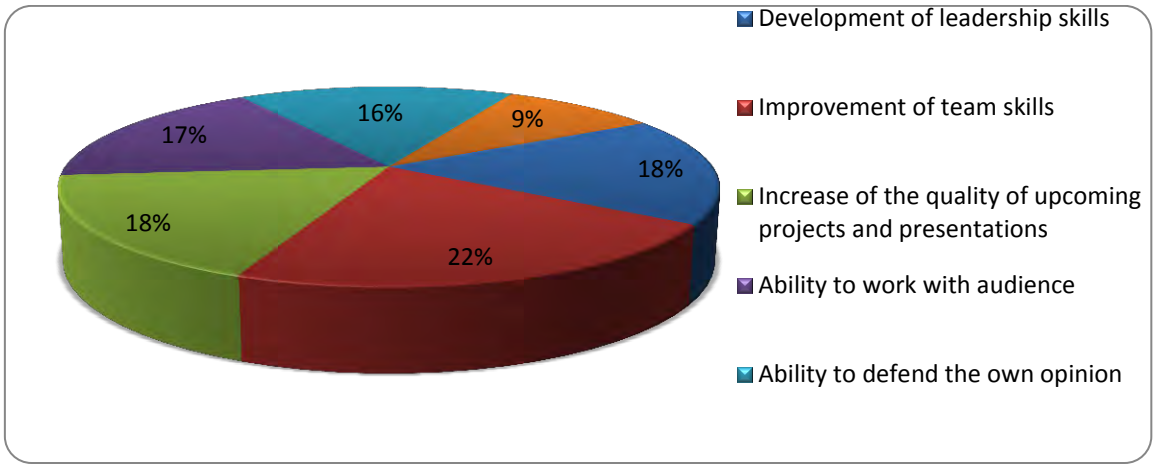
Because, the method of Thought leadership and synthesis of information was for the first time applied in the teaching of subjects taught by teachers of the Department of Marketing and Trade in the winter semester of the academic year 2015-2016 their effort was to obtain the opinions of students actively involved in the project through a questionnaire survey. Answers to the questions were recorded by the respondents into previously prepared questionnaires. The obtained data were processed into graphic form.

As it can be seen from the figure 1, most of our respondents think that the most important advantages of the method of Thought leadership are exactly the improvement of team skills, the development of leadership skills and the increase of the quality of upcoming projects and presentations.

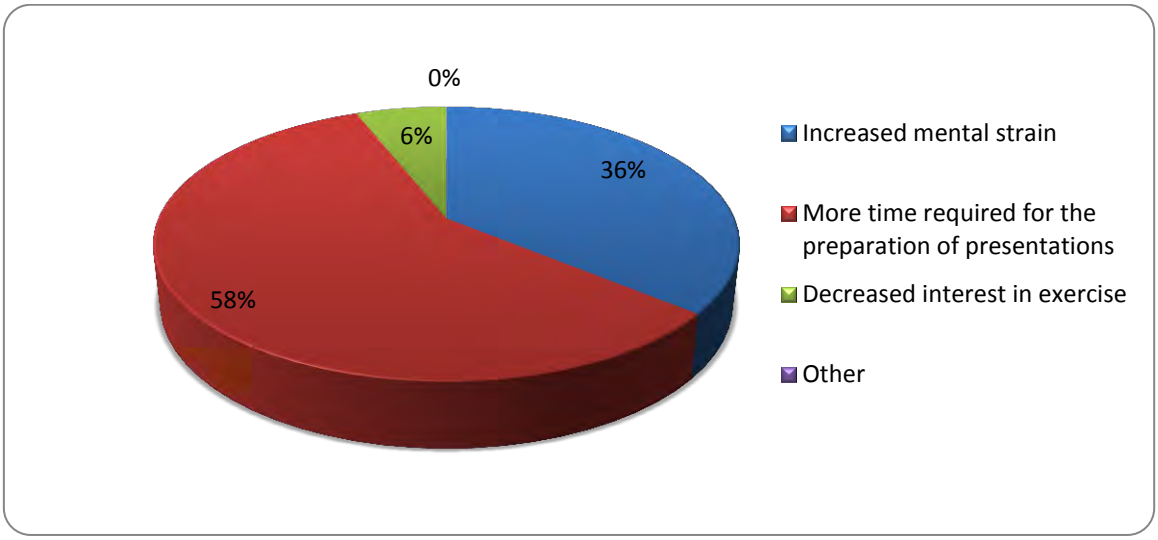
Figure 1: Advantages of the method of Thought leadership



Source: Own research and processing of

To obtain the opinions of the respondents on the problems which were encountered in connection with the application of the method of Thought leadership was important exactly because of the need of improvement of the use of this method and its extension to the exercise of other objects.

Figure 2: Problems encountered in connection with the method of Thought leadership



Source: Own research and processing of

As it can be seen from the figure 2, the biggest problem which was encountered in connection with the application of the method of Thought leadership by our respondents was the fact, that

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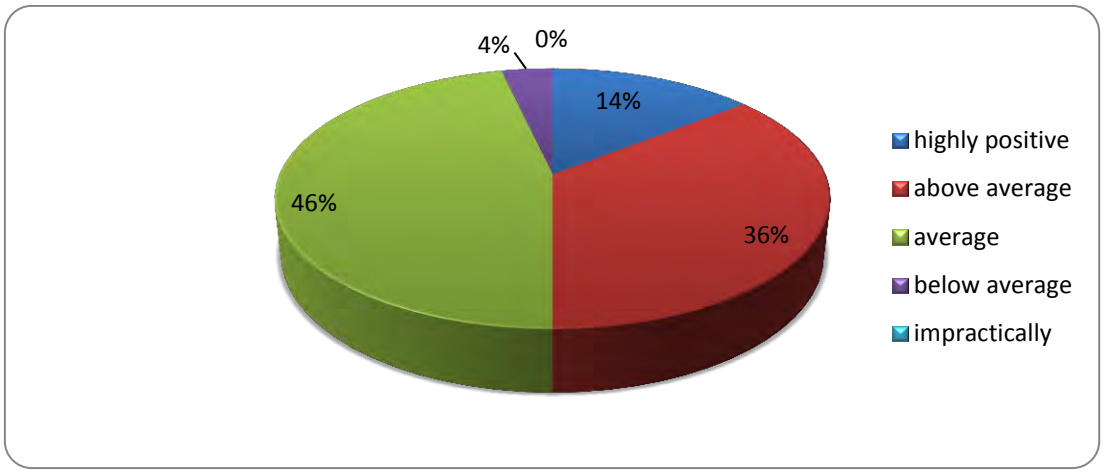
the students have needed more time for the preparation of their presentations what is understandable because as it was mentioned before, the tasks given to students during their exercises simulate real problems of existing businesses and that is why, they need also more time for their solving and preparation as simple seminary works which are oriented only on the theory.

Very interesting were the answers of the respondents aimed at the evaluation of implementation of the method of Thought leadership, which can be seen from the figure 3 and which shows that most of our respondents think that the implementation of the method of Thought leadership was average (46 % of respondents), respectively above average (36 % of respondents).

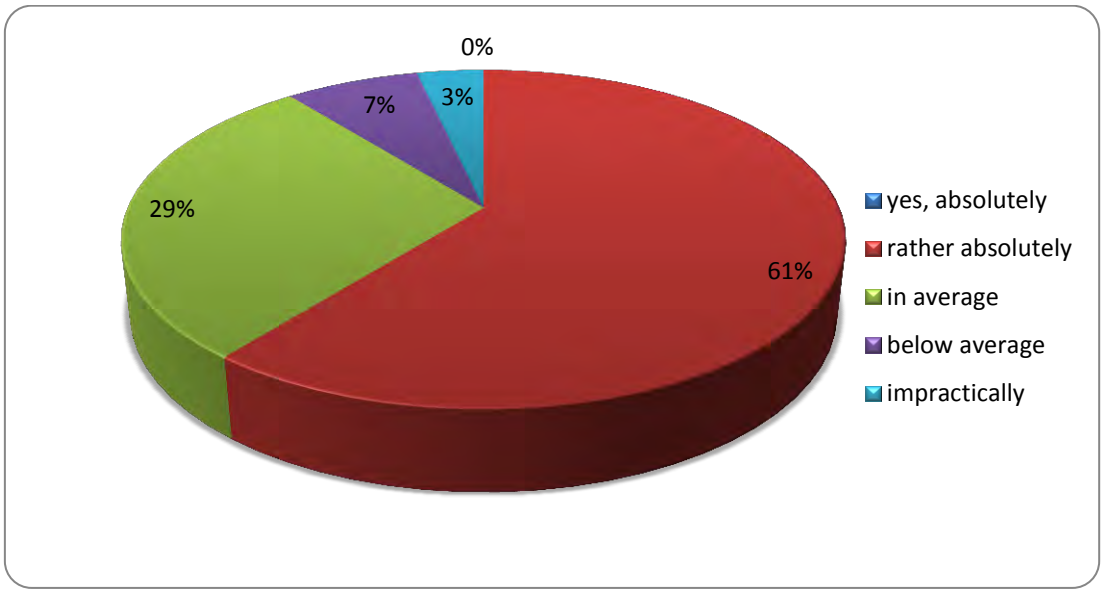
Figure 3: Evaluation of implementation of the method of Thought leadership



Source: Own research and processing of

Up to the question of that, even if the exercises connected with the implementation of the method of Thought leadership have met their expectation, most of our respondents, exactly 61 % of them have said that rather absolutely (Figure 4).

Figure 4: Fulfilment of expectations connected with the implementation of the method Thought leadership



Source: Own research and processing of

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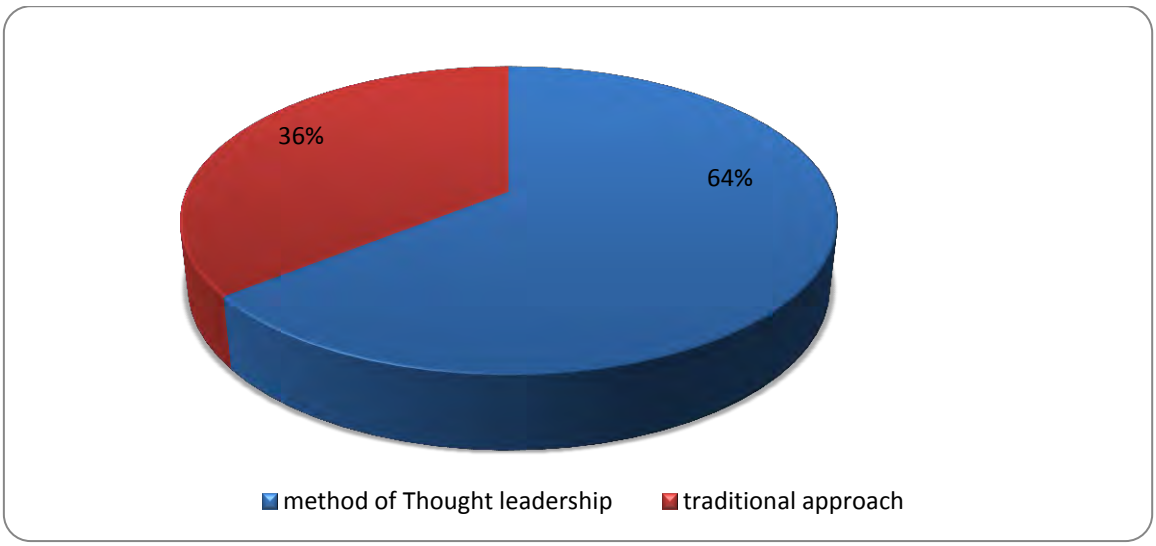
What is also a very positive results of our research is the fact that exactly 18 respondents, from the total number of 28 respondents suggests this method also in the future (Figure 5).

Figure 5: Preferred approach to teaching



Source: Own research and processing of

Up to the evaluation of the last formulated question in our questionnaire, the question aimed at proposed changes concerning the use of method of Thought leadership in exercises, it can be said that the most important tasks for teachers are the following one:

- to choose interesting and current topics oriented to practice,
- to specify the task at the beginning of the semester, so that there will be a sufficient time for the development of the project and PPT presentation,
- to reserve more time for presentations of students to make exercise more interesting,
- to spend more time with discussion.

4. Conclusion

The sustainability of the project will be provided at the Faculty of Economics and Management, Slovak University of Agriculture in Nitra also by that, that the method of Thought leadership and synthesis of information verified on the subject of Global Marketing and Retailing and Merchandising will be gradually implemented into other subjects taught at the Department of Marketing and Trade. In connection with the creation of the project teams, we expect the generation of smaller, 2-3 member teams, or their handling by individuals. projects will be handled by individuals. The success of the used method will be determined by the incorporation of the comments of our students.

Among the recommendations for teachers, related to the implementation and improvement of the method of Thought leadership for the future, we can include:

- to prepare a syllabus,
- to plan the exercises, where the method of Thought leadership and synthesis of information will be applied,
- to develop a structure of student presentation and determine its duration,
- to select the recommended literature, which will help the students in preparation of their presentations,

- to choose the domestic and foreign experts, who will participate in the successful process of the course and in mastering of the solved problems, as well as in the development of competencies,
- to develop an incentive mechanism that will encourage students to actively participate in managing selected problem areas through the application of this method.

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Mathematics study outcomes as an indicator of the quality of the university education

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Abstract
The main aim of this contribution is to analyze the study outcomes in mathematics, which are an important indicator in assessing the quality of university education. We focused on students' knowledge in solving the tasks of mathematical analysis and linear algebra. Method of statistical testing of hypothesis was used to evaluate and analyze the results of students in selected tasks. The obtained number of points in math tasks became the object of hypotheses which were verified by methods of F-test and t-test. Knowledge and skills acquired from mathematics will be useful basis for the study of another exact methods and procedures from mathematics and statistics. It is assumed that students will apply these methods in the analysis of empirical data in the bachelor and diploma theses.

Keywords: *mathematics education, study outcomes, quality of education, statistical hypothesis testing, employment of graduates, food science*

JEL Classification: *I21, C12, C60*

1. Introduction

In the conditions of information society the content of education is still changing and very quickly updating. University study programs reflect the requirements of the labor market that requires creative, flexible and quick minded people.

At the Faculty of Biotechnology and Food Sciences (FBFS), the Slovak University of Agriculture (SUA) in Nitra, opportunities for employment of graduates are primarily focused to the area of biotechnology and food processing.

Universities are searching possibilities how to attract students, how to offer high quality education and how to bring value added and differentiation to the university education. Competitive environment around us generates need of high quality, unconventional and innovative solutions in the sphere of higher education everywhere in the world. Bologna process is one of those approaches enabling harmonization and mutual cooperation of universities around the world (Horská, Ubrežiová and Palková, 2015).

Professional public accreditation of educational programs shall be the recognition that the quality and level of training of graduates who have studied such an educational program at a particular educational organization meet the requirements of professional standards and labor market set for workers and employees of the relevant specialization (Petropavlovskiy, Smelik and Nefedova, 2015).

Most of the agro-food complex enterprises see opportunities especially in the internationalization, globalization and regionalization in the agri-food sector, in pursuance of

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this, they are gradually smouldering innovative activities and trying to work on their competitive advantages (Ubrežiová, Kapsdorferová and Sedliaková, 2012).

2. Data and Methods

The first aim of this paper is to identify important and interesting questions associated with the quality of mathematical education of future engineers for the area of food science. At the SUA in Nitra the scope of their mathematical course is only one semester with the range: 1 hour of lecture per week and 3 hours of practical seminar per week.

We obtained data about students' skills and knowledge from the teaching of obligatory subject Mathematics (taught in the 1st study year of bachelor degree). We focused on two basic topics of the mathematics course:

- function of one real variable,

- linear algebra.

We summed up results from students' partial tests during semester and final exam tests. Given test tasks are in accordance with the study literature (Országhová, Matušek, Pechočiak, Baraníková and Drábeková, 2013), (Országhová, Hornyák Gregáňová, Pechočiak, Farkašová, Drábeková and Kecskés, 2014). Appropriate methodology for analysis of obtained data followed from the aim; we used these statistical methods:

- *F*-test,

- parametric two sample *t*-test.

The detailed description of these statistical methods can be found in Markechová, Tirpáková and Stehlíková (2011). The existence of dependences and statistical significance among obtained data were examined by mentioned statistical testing methods. Firstly we analyzed the responses via statistical *F*-test whether observed random samples have the same variance. We test the null hypothesis $H_0 : \sigma_1^2 = \sigma_2^2$ versus the alternative hypothesis $H_1 : \sigma_1^2 \neq \sigma_2^2$.

Then we applied two-sample *t*-test with equal variance. We test the null hypothesis about the samples means $H_0 : \mu_1 = \mu_2$ versus the alternative hypothesis $H_1 : \mu_1 \neq \mu_2$. The statistical significance was verified through the *p*-value, which is the probability of an error that occurs when the tested hypothesis is disapproved. If the calculated *p*-value is sufficiently small ($p < 0.05$, resp. $p < 0.01$), then the test suggests that the observed data are inconsistent with the null hypothesis, so the null hypothesis have to be refused (at the chosen significance level 0.05, resp. 0.01).

The second aim of this paper is to present results of realized survey about the employment of graduates of the Faculty of Biotechnology and Food Science. This survey was realized during the period from November 2015 to December 2015. We used the method of an exploratory questionnaire to identify graduates opinions about their education and career opportunities after students' graduation from the university.

3. Results and Discussion

Mathematical knowledge and their level are being studied in this contribution and we are focusing on the students of FBFS. After graduation of engineers trained for the area of food production and food science, they often use mathematics apparatus and methods in various specialized fields.

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The assessment of learning outputs is one of the crucial components of the instruction. The teachers have different ideas regarding the implementation of assessment strategies. Assessment should be objective; it should correspond to the level of knowledge achieved by students in education. Authors trying to figure out whether the final grade for the exam in the fall semester is right for the level of students' knowledge acquired in the second summer term follow-up on the results of the partial test (Švecová, Drábeková and Hajdúk, 2014).

3.1 The analysis of study results via statistical testing of hypothesis

The first research objective is to evaluate the level of students' knowledge of mathematical compulsory subject Mathematics taught in the summer semester. In the Table 1 numbers of students with examination grades are summed up from subject Mathematics within the period 2010 − 2015. Based on the average classification (last column in the Table 1) we can conclude that learning outputs in mathematics within the period 2010 - 2015 are balanced and without major fluctuations. This is also confirmed by the numbers of students with exams grades A(1) - E(3) in separate years.

Table 1: Numbers of students with given exam grades in Mathematics at FBFS (2010 – 2015)

	Number of students with grade					Number of students	
Year	**A(1)**	**B(1.5)**	**C(2)**	**D(2.5)**	**E(3)**	**Failed or unfinished**	**Average classification**
2010/2011	36	30	33	37	64	119	2.16
2011/2012	43	22	27	25	43	51	2.01
2012/2013	46	16	24	38	52	53	2.09
2013/2014	61	23	28	22	54	56	1.96
2014/2015	41	16	17	28	57	56	2.14

Source: authors' calculations

In the contemporary educational system students are not motivated to achieve better study results and do not understand the importance of the use of mathematics. For teachers it is difficult to teach mathematics applications without basic knowledge from mathematics.

In this section we will continue in analysis of the study outputs within the period of two academic years: 2013/2014 and 2014/2015. The first statistical sample consisted of 86 respondents (students) of the Faculty of Biotechnology and Food Sciences (FBFS) in academic year 2013/2014; second one consisted of 61 respondents (students of FBFS) in academic year 2014/2015.

Topics from the theory of functions and linear algebra belong to the basic parts of taught course Mathematics. Math tasks from written tests were about functions, derivatives, matrices and systems of linear equations. Analyzed data were obtained as the number of points in solving these math tasks by students in partial test and exam test. For the right answer the student could obtain maximum of 10 points in each task. We realized the selection of students by single survey, non-anonymously. Then the list has been changed into anonymous; each student has appeared in the table with the serial number and with obtained points. Data processing of the statistical sample was realized by mentioned statistical methods of F-test and two samples t-test with the usage of MS Excel 2010.

We tested two hypotheses.

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The formulation of the first null hypothesis H_{01}:

Students achieve equal level of knowledge in the topics matrices and systems of linear equations.

Table 2: Data testing and observed statistical characteristics (academic year 2013/2014)

Topic	Matrices	Systems of linear equations	Function property	Function derivative
Frequency	86	86	86	86
Average number of points	7.77	7.78	6.24	6.42
***F*-test**	0.64 > 0.05 (no significance)		0.64 > 0.05 (no significance)	
***t*-test**	0.86 > 0.05 (no significance)		0.099 > 0.05 (no significance)	

Source: authors' calculations

We realized calculations via tools of MS Excel 2010 and our obtained results are in the Table 2.

Based on carried out statistical tests we can conclude that:

- In *F*-test we got inequality *F*-test > 0.05; it means that the difference between the variances is statistically insignificant. The null hypothesis $H_{01}: \sigma_1^2 = \sigma_2^2$ cannot be refused.
- Since the calculated value of the *t*-test criterion is greater than 0.05 the null hypothesis $H_{01}: \mu_1 = \mu_2$ cannot be refused. The differences in compared values are statistically insignificant, caused only by random factors.
- Students achieve the same level of knowledge in the topics matrices and systems of linear equations. Finally, we can state that students achieve the same level of knowledge in the topics function property and derivative of a function.

Table 3: Data testing and observed statistical characteristics (academic year 2014/2015)

Topic	Matrices	Systems of linear equations	Function property	Function derivative
Frequency	61	61	61	61
Average number of points	6.89	7.10	4.11	5.51
***F*-test**	0.93 > 0.05 (no significance)		0.95 > 0.05 (no significance)	
***t*-test**	0.94 > 0.05 (no significance)		0.004 < 0.05* (significance)	

Source: authors' calculations

The formulation of the second null hypothesis H_{02}:

Students achieve equal level of knowledge in the topics functions and derivative of a function.

We realized calculations via tools of MS Excel 2010 and our obtained results are in the Table 3. Based on results of statistical analysis outputs in 2014/2015 we can conclude that:

- In *F*-test we got inequality *F*-test > 0.05; it means that the difference between the variances is statistically insignificant. The null hypothesis cannot be refused.

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- In the first case (topics - matrices and systems of linear equations): Since the calculated value of the *t*-test criterion is greater than 0.05 the null hypothesis $H_{02}: \mu_1 = \mu_2$ cannot be refused. The differences in compared values are statistically insignificant. Students achieve the same level of knowledge in the topics matrices and systems of linear equations.
- In the second case (topics - function property and function derivative): Since the calculated value of the *t*-test criterion is less than 0.05 (0.004 < 0.05) the alternative hypothesis $H_{11}: \mu_1 = \mu_2$ cannot be refused. The differences in compared values are statistically significant. Students achieve different level of knowledge in the topics function property and derivative of a function. From average number of points follows that in solving the task "derivative of a function" students gained more points.

The usefulness and applicability of mathematical knowledge are found in many publications. As an example, we can mention the use of mathematical tools and methods for the calculations in molecular biology and biotechnology in the book “Calculations for molecular biology and biotechnology: a guide to mathematics in the laboratory” (Stephenson, 2010).

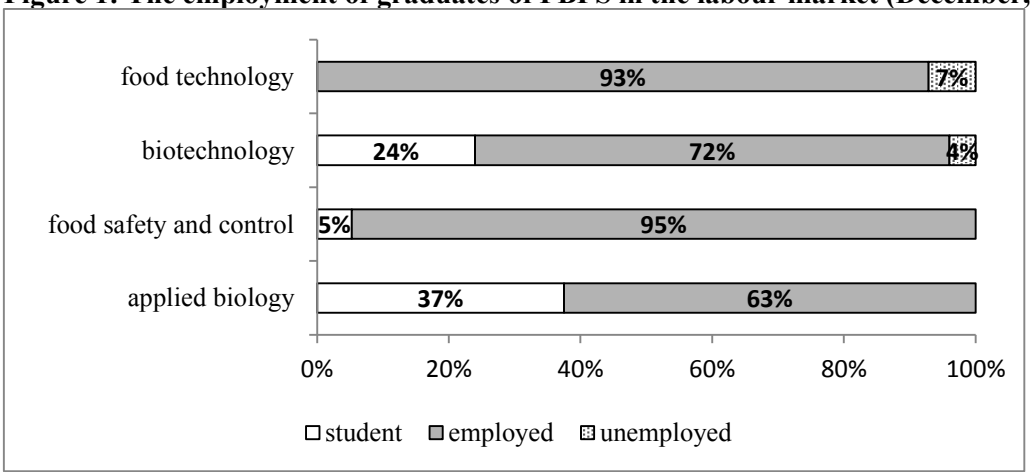
Applications of functions, derivatives and differential equations in microbiology are presented in the paper (Drábeková and Kecskés, 2010); authors focused on the model of the bactericidal effect of ultraviolet radiation. In terms of increasing the efficiency of the learning process in mathematics is needed, and might even be necessary, to present and teach applications of special mathematical methods in engineers practice and research.

3.2 The survey about the employment of graduates of FBFS in the labor market

Food science and biotechnology are important part in the issues of the sufficiency of food and nutrition for people. Interest in transgenic foods has grown rapidly in recent decades. Hudson, Caplanova and Novak (2015) used Eurobarometer 73.1 survey data on biotechnology, science and technology, with 15,650 respondents. They found that attitudes to the risks and gains are determined by socio-economic variables and also by the individual's knowledge, scientific background, their parent's education in science and their religion.

The current labor market trends are associated with high requirements for professional abilities of university graduates. At the Faculty of Biotechnology and Food Sciences, the Slovak University of Agriculture in Nitra, opportunities for employment of graduates are primarily focused to the area of biotechnology and food processing.

Figure 1: The employment of graduates of FBFS in the labour market (December, 2015)



Source: authors

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In this context, we decided to find out in cooperation with teachers from the faculty FBFS the current situation of job placement of graduates. The sample consisted of graduates from of FBFS in academic year 2014/2015. During the period of months November - December, 2015, was conducted a survey at the Faculty of Biotechnology and Food Science (FBFS). The main interest was to find out the rate of employed and unemployed graduates in the labor market. Via the questionnaire it was interviewed 289 graduates; 107 respondents (graduates) sent back the questionnaire replies. Based on data, it was found that after graduation form SUA in Nitra in years 2014 and 2015 only 2.8 % of respondents are unemployed. Figure 1 shows the classification of the faculty graduates in engineering study programs according to their economic activity at the end of December, 2015.

Based on the results of actual survey about the employment of graduates from the faculty FBFS we can state that graduates found jobs in areas they had studied. Adding another result, from the group of 107 respondents of the survey 15 persons reported that they are working in the area of "professional, scientific and technical activities". We could assume that better knowledge in mathematics and statistics can help students to find a job in various professional and research areas after graduation.

Ongoing internationalization and world globalization processes significantly shape the market for agri-food products. Businesses face requirements to meet ever more stringent public food safety standards and maintain customer confidence at a time when global supply chains are becoming more complex. Various kinds of analysis of agri-food products are based on interdisciplinary research and knowledge. Authors (Mura, Buleca, Zeleňáková, Qineti & Kozelová, 2012) have dealt with the analysis of selected indicators of Slovak dairies international business activities within the EU. The research has shown that contacts management has been important in the penetration of Slovak dairies into target foreign markets.

Applied mathematics combines mathematics, statistics, computer science, physics, engineering, economics, and social sciences to solve real-world business problems. High school graduates still have interest in university education and some of them will have to solve current research problems using interdisciplinary methods of applied mathematics.

Conclusion

The main aim of this contribution was statistical analysis of mathematics study outcomes as an indicator of the quality of mathematics education at a university. We analyzed students' knowledge in the solving tasks from mathematics in the summer semester of the 1st study year at the bachelor degree. Tasks were focused on four topics: matrices, systems of linear equations, function with one real variable and derivative of a function. Analyzed data were obtained as number of points from solving math tasks by students of FBFS. Points of selected tasks became the object of formulated hypotheses which were verified by statistical methods of F-test and t-test. In the contemporary society the education is gaining new attributes and for university graduates the level of knowledge and abilities is very important factor for employment on labor market. In the contribution we presented outputs to the second main aim of the paper: results of conducted survey among graduates of the Faculty of Biotechnology and Food Science of SUA in Nitra.

- Based on the obtained results of statistical analysis, we can conclude that some students have abilities to use and handle mathematical apparatus on very good level. Via the cross-curricular relations the quality of university education can be improved and help students to understand and combine knowledge of different areas.

- The level of students' knowledge from topics functions and linear algebra is adequate and fairly balanced. According to research results we can state that there are no significant differences in students' knowledge in topics matrices and systems of linear equations. Next, we found that there exist significant differences in students' knowledge in topics function property and function derivative.
- From the questionnaire and gathered views of graduates we can claim that students of the Faculty of Biotechnology and Food Science, the Slovak University of Agriculture in Nitra, consider the study of food science and biotechnology branches as a good foundation for their success in the labor market after graduation from the university.

The education of future experts and scientists in the field of biotechnology is important from many aspects. University study programs relating to food products, food science and food industry will always have the important position in the university educational system.

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From multimedia to virtual worlds - innovative learning at Slovak University of Agriculture

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Abstract
The project PacAgro (543902-TEMPUS-1-2013-SK-TEMPUS-SMGR) aims to develop the Public Accreditation of Agricultural Programs in Russia. One of the important part in the quality high education represent the didactical tools and methodologies. Multimedia, information and mobile technologies or virtual reality bring new forms of learning materials or assignments, which, besides the fact that are available anytime and anywhere, fundamentally changing the way of education.
Slovak University of Agriculture in Nitra thanks to participation in the several projects supported by European Commission, has implemented innovative methods of education and make the educational process more attractive by using multimedia, mobile technology and virtual reality.
The "FITR – Food Incubators Transforming Regions" comprises unique training curriculum and course materials to successfully establish and manage food incubator hubs to cater for the growing numbers of emerging food entrepreneurs who are in urgent need of a place to produce, learn and grow. It targets community drivers, development agencies and VET bodies.
The "RUBIGAS - Agrobiogas as an alternative source of energy in rural areas", through innovative training materials, transfer of know-how and acquisition of new skills and competencies of farmers and employees of agriculture sector, focuses attention on support educational efforts to disseminate knowledge on agricultural biogas plants and renewable energy sources.
The "MobiVET 2.0 - Mobile Web 2.0 e-Training for Vocational Education Trainers" aims to fill the online training gap between the self-directed learners and VET trainers by developing m-learning 2.0 knowledge and skills of the trainers thus turning them from in-class trainers to skilled online tutors.
The „AVARES - Enhance attractiveness of renewable energy training by virtual reality" aims to create innovative learning methodologies and integrate them with traditional learning. The developed Hybrid Educational Platform combines traditional learning procedures offered to students via LMS Moodle with learning procedures delivered to students in 3D Virtual World.

Key words: *Innovative learning, mobile technology, virtual reality, accreditation*

JEL classification*: I2 - Education and Research Institutions*

1. Introduction

Information and Communication Technologies (ICT) and e–learning tools are well known and there are no actual limits for their technical realization. It is not reasonable in recent time to stick to strictly traditional educational methods, given that introduction of e–learning methods into the teaching process, according to many experimental results, will clearly bring positive results. However, it's necessary to make some rather radical changes in the teaching way:

- **Change in the way of teaching/training.** The traditional teaching model is based on reproduction of teacher's knowledge by students. A student may gain a huge amount of encyclopedic knowledge, but he/she is not able to update it or use it effectively in practice. Current pace of knowledge development and evolvement has as a result that knowledge gained this way doesn't reflect the reality. So, teaching students how and where to get necessary information and knowledge and how to use it, when they really need it, should be the main objective of teaching.

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- **Change in the way of knowledge presentation**. Existing ICT tools enable creation of multimedia based textbooks and electronic courses made available on the Internet. Knowledge can now be displayed using multimedia, realistic animations, 3D objects, virtual reality etc. This allows students to gain updated training knowledge from several sources, from any place, at any time and in a more comprehensive way. Such access to teaching/training materials will allow lifelong learning for people without interrupting their work duties. At the same time, number of students using developed courses and thus enhancing their sphere of activities will increase, together with their training effectiveness improvement.
- **Change in learning materials.** At the present time books are not the only source of knowledge. Availability of electronic learning materials and complete courses continually increases. Internet connection of training institutions and smart devices allow access to various electronic learning sources at any time and from any place.
- **Change the role of teacher**. From knowledge provider, the teacher should be transformed into an e–learning methods and materials integrator. However, creation of e-learning materials and courses requires a tight cooperation of several experts – a teacher, a graphic designer, a programmer, an analyst etc.
- **Change of students' responsibility for knowledge level**. Today, the teacher is the person holding the responsibility for students' knowledge level. In the e-learning era, the student would be the only person responsible for his/her knowledge level.

Despite the fact that the role of information and communication technologies is important for online learning, it is impossible to ignore the pedagogic point of view. It will never be possible to carry out the training process only through ICT, with no teacher participation. Even though the new technologies will significantly change teacher's role in the learning process, they will never substitute for the teacher's personality. Teacher's role will always be motivating students, advising them in their study progress, giving them vision and meet his/her social role.

2. Innovative technologies for education

2.1. Multimedia technologies in education

"Multimedia" is often a subject of ambiguous interpretation, as we can see it in citations from a variety of resources. According to the Webster's Desk Dictionary (Merriam-Webster), multimedia indicates using more media simultaneously. Jonassen (Jonassen, 1996) defines multimedia as integrated media such as text, images, animations, audio and video. Encyklopedica Britannica (Britannica, 2016) defines multimedia as several computer systems allowing usage and manipulation with several types of media such as text, audio, video, computer graphics and animation. The Columbia Electronic Encyclopedia (Encyclopedia, 2016) defines multimedia in computers as the software and applications using audio, 2D and 3D graphics, photos, animations and video. Introduction of term "interactive" by the TechTarget (TechTarget, 2016) means a qualitative progress – TechTarget defines multimedia as more than one competitive media while the media might be interactive, e.g. operated by means of voice, mouse, touchscreen, text etc., with the possibility of videoconference. Švejda (Švejda, Palková, & et al., 2006) takes multimedia as an automated process, containing at least three mutually independent usable information channels, leading from the learner to the system or vice versa, while at least two of them lead from the learner and at least one is used for transfer of learner's reaction to the system.

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Creation and distribution of electronic training materials is an important part of all e–learning. Electronic training materials are applications combining text interpretation and multimedia. It requires synoptic processing, intuitive control and easy access to online and offline information.

Electronic training materials can be distributed through the Internet (online) or data media such as CD/DVD, USB flash, memory cards (offline).

Creating high quality multimedia materials requires good knowledge of necessary hardware and software technologies. It's also necessary that the content of individual materials be professionally prepared, therefore a tight cooperation of teacher (or other expert in the field) and graphic designer or programmer is necessary.

2.2. Mobile Learning (m-learning)

Mobile Learning (m-learning) referred also as "anytime, anyplace learning" (Caudill, 2007), (El-Hussein , 2010) has evolved with the introduction of mobile and hand-held devices, such as mobile phones, laptops, netbooks and tablet PCs, in teaching and learning, together with broadband and wireless data transmission. This greater connectivity creates opportunities for flexible, collaborative modes of learning, whilst supporting stronger links between learning at work, in the home, at school or in the community (Figueredo, 2015).

From this point of view, mobile learning allows truly anywhere and anytime, personalized learning, which through nonconventional devices and methods make traditional lessons or courses more attractive. Using mobile communication - for young people native forms of communication - helps learners and teachers to recognize and build on existing basic literacy skills and can help deliver and support literacy, numeracy and language learning.

At last but not least, mobile learning helps to combat resistance to the use of ICT by providing a bridge between mobile phone literacy and PC literacy.

In present time a great variety of mobile computers and devices are available. Laptop computers outnumber desktop computers, while notebook computers, tablets and cellular "smart" phones are considered to be the most important hardware items used for m-learning activities.

Mobile devices can bring users following advantages (eschoolnews, 2014):

- spontaneity - learning activities take place when the learner feels ready, or can be used to fill "dead time";
- immediacy - learning becomes possible at the point of need, regardless of location;
- increased access - learning resources can be accessed from the workplace and in the field, while traveling, and during classes or lectures;
- portability - communication with peers and tutors, and the capture, storage and retrieval of information in multimedia formats are possible from one device at any location.

2.3. Virtual reality

"Virtual World" term is used to describe digital spaces that can be explored from within, where users can navigate through, interact with objects, other users and soft bots. Users can exchange information via text, audio, still images, animation and video. Usually, the user's presence is facilitated by an "avatar" - a digital 3D object that is used to represent the user. This representation is chosen by the user who may decide if his/her virtual identity has any real-world resemblance.

The currently popular virtual worlds are three-dimensional (3D) computer rendered environments, which can be accessed over a network, usually via Internet, populated by users in form of avatars, which interact with the simulated environment and other users. These virtual worlds have been moved beyond gaming and chat environments and have been transformed

into powerful communication and education tools. The sensory immersion and the way of communication with other users make them a feasible alternative approach to tasks such as, distance learning and training, world-wide communication and collaboration. The number of private and public virtual world users grows steadily, from 300 million users world-wide in 2008 to forecasted 1 billion users in 2017 (Council, 2016), populating existing and new virtual worlds that are constantly being developed.

According to Gartner Research (Gartner, 2015) statement dated 2008: "Public virtual worlds, which are suffering from disillusionment after their peak of hype in 2007, will in the long term represent an important media channel to support and build broader communities of interest".

Virtual worlds are becoming a major technology, useful for teaching, learning, research and collaboration. Virtual worlds constitute a growing online space for collaborative play, learning, edutainment and work.

3. Innovative learning: examples of good practice

3.1. FITR project

The Food Incubators Transforming Regions (FITR) project brings together partners from Northern Ireland (Banbridge Distinct Council and Canice Consulting), Slovakia (Slovak University of Agriculture and New Edu, n.o.), Netherlands (Stitching Business Development Agency) and Irish partners Momentum Marketing and Roscommon LEADER Partnership.

Project objectives

The project started in September 2015 and over 24 months, FITR plans to achieve in four regions - in Ireland, UK, Slovakia and Netherlands, four key deliverables:

- Through a Triple Helix leadership network to establish four sustainable, sector focused Regional Partnerships to study and capture best practice in the development of Food incubators and.
- Create and publish a "The Essential Guide to developing a Regional Food Incubator" to focus on "how-to" strategies for food hub establishments and operations that are based on successful models operating in other regions and new concepts from the US (the market leaders in food incubators).
- Create and publish a course curriculum, guiding Vocational Education and Training practitioners on the topics and skills most needed to establish and manage a Food incubator.
- Develop an intensive blended learning "The Essential Toolkit to develop a successful Food Incubator" course based on open education resources, targeting regional change makers in local government, development agencies, communities, businesses, not-for profits and others interested in establishing food hubs.

While across whole European Union many communities and local government bodies see merit in developing food incubators, they lack the skills to realise same. The FITR toolkit and online training course cover different formats of food incubators:

- regional value-added food processing centres,
- shared-use community kitchens,
- shared-use agricultural processing facilities, which are designed for use by farmers for collective grading, processing and packaging of farm produce or other commodities,
- mobile incubators that can go to primary producers.

Rather than solely focusing on the final target group, partnership harnesses the knowledge triangle of actors working in food, regional marketing, and wider economic development. This

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enables us to ensure the relevance and provide greater strategic focus to our training course, but also to create a more enabling environment for food incubators to be adopted as a driver of food entrepreneurship in the EU. This will be achieved though the creation of 4 Regional Partnerships.

FITR Course Curriculum & Content

At the end of the project FITR Course Curriculum & Content will be available in 3 languages (English, Dutch and Slovak) and based on the following principles:

- comprehensive and relevant course curriculum and content;
- comprehensive and relevant set of open educational resources, which together comprise the course content, but which can also be used independently.

Course curriculum comprises 6 modules and covers following topics:

- Creating possibilities for food incubation in the Region - a series of modules to train participants how to review of the potential of the sector through learning how to conduct a robust and credible feasibility analysis, the research tools to establish need and methodologies to harness support, identify suitable premises, how to technically assess and SWOT each building and negotiation skills to acquire the building at preferential rates.
- Different Models of food incubators - training to allow participants to synthesize best practices models and assess best fit for themselves; regional value-added food processing centres; shared-use community kitchens; shared-use agricultural processing facilities, which are designed for use by farmers for collective grading, processing and packaging of farm produce or other commodities; mobile incubators that can go to primary producers premises and act as in situ production units.
- Food incubators business strategy - the nuts and bolts of running a food incubator, licensing options for operators, kitchen management protocols, adding value to your incubator e.g. shared sales & distribution platforms.
- Stimulating demand - tools to develop a pipeline of new food entrepreneurs in your region through Pre-Incubation supports and mechanisms, creative marketing of the resource.
- Accessing resources - training in innovative access to public finance, crowd funding potential and attracting corporate sponsors.
- Connecting to collaborations & communities - the potential of co-working, new methodologies for creative collaborations, parameters of same and success tools.

The course will be taught in a blended learning format and duration of each module represents 25- 30 hours of self-guided online and classroom based learning with:

- Classroom training course designed for use by HEI - VET and Business Support providers. Learning will embedded through self-assessment exercises (leading to a course certificate), peer to peer communications and setting up an ideas portal for participants who may like to collaborate with other emerging food incubator developers.
- Mobile and online learning resources for individual private study.
- Training notes for HEI-VET and Community Business Support providers to integrate our course and open educational resources into their offerings.

3.2. RUBIGAS project

With the aim to bridge the gap between the theoretical aspects of interest about the sustainable development, especially biomass/biogas exploitation in agrosector, its practical delivery and training needs, RUBIGAS Needs Analysis has been designed. Based on the outcomes of the realized Need Analysis the form of the RUBIGAS training materials are processed through

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usual technologies – the LMS Moodle support, using multimedia elements and Web 2.0 technologies.

From the educational activities point of view respondents highlighted the needs of formal and informal education in the field of renewable energy, with emphasis on the current, brief and accurate information, supported by case studies and examples of good practice. Suitable forms of education were mentioned in particular e-learning courses supported by "live" case studies and presentations of examples of good practice.

Problematic factors of education and practical implementation of the acquired knowledge, respondents identified primarily lack of time and lack of really valuable training courses/activities. Moreover, respondents emphasized the necessity to support these educational activities –during present inefficient agricultural production in most of countries farmer doesn't have time for fulltime education.

Based on the results of Needs Analysis, interactive learning materials have been developed. These are published through traditional learning platform – Learning Management System Moodle (Fig. 1). In the frame of the project following modules have been developed:

- General,
- Biomass,
- Agro-biogas plants,
- Geothermal energy,
- Solar energy,
- Water energy,
- Wind energy.

Fig. 1 Examples of learning materials in RUBIGAS learning platform

3.3. MobiVET 2.0 project

The MobiVET2.0 (MobiVET2.0, 2015) project aims to fill the online training gap between the self-guided learners and VET trainers by developing mobile Web 2.0-based [16] knowledge and skills of the trainers thus turning them from in-class trainers to skilled online mobile tutors (e-tutors). The project identify the obstacles to mobile e-tutoring and address and alleviate these problems by demonstrating existing online learning and tutoring applications and practices based on Web 2.0 technologies to trainers showing their pedagogical and didactical benefits.

The project shows how the Web 2.0 technologies may be used simply by non-IT experts, using sample courses and guidelines developed during the project.

With the aim to evaluate developed methodology how to create and use mobile courses from both the teachers' and the students' perspectives were developed seven m-learning courses. These mobile courses are available at MobiVET2.0 platform [15]. Four of them were developed with the aim to introduce sample of m-courses for teachers:

- Emotional Intelligence in the Workplace,
- Green Office (Fig. 2),
- Intercultural Skills,

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- Leadership Skills.

The last three courses are targeted primarily to improving the skills of teachers/trainers in the field of m-learning and developing of m-courses:

- E-learning practices in VET,
- Applying social media in VET,
- Web 2.0-based Mobile Technology in VET.

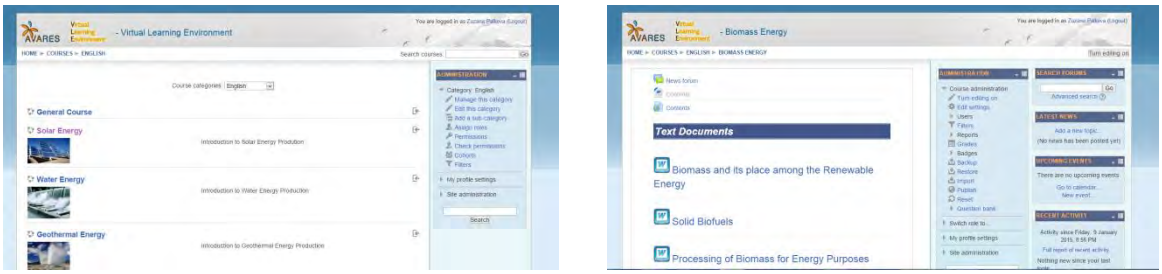
The project therefore broaden the e-skills and competencies of European VET practitioners (teachers, trainers and tutors) and help develop adequate online training practices for effective distant tutoring of lifelong self-learning activities at the workplace and on the go without time and distance barriers. This way the project supports the development of innovative ICT-based tutoring services, pedagogies and practices for lifelong learning.

Fig. 2 Examples of multimedia learning materials in m-learning courses

3.4. AVARES project

The project aims to create a 3D virtual learning environment and multimedia leaning materials for vocational education and training in the field of renewable energies. A hybrid education platform developed in the project combines traditional educational practices, provided via learning management system (LMS) Moodle (Fig. 3) and a virtual world (3D RES Park)

Fig. 3Virtual learning environment combines the advantages of LMS Moodle and virtual reality



LMS Moodle focuses on the learning process management and delivers to students a theoretical background for the RES field. Students can explore and learn about RES domain through 5 courses (Fig. 3):

- Solar Energy,
- Water Energy,
- Wind Energy,
- Geothermal Energy,
- Energy of Biomass.

Students can register to the Virtual Learning Environment (VLE) platform and create personal accounts. After that, they can anytime access the platform with their credentials. The course material mainly consists of multimedia materials that the students can download and study on their own pace. Learning materials also include textbooks, web-pages, animations and videos.

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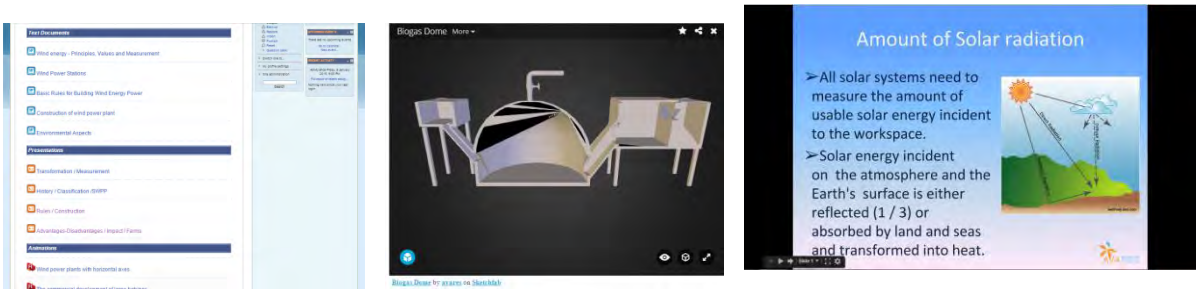
At the Fig. 5, some examples of multimedia content in the Virtual Learning Environment are illustrated.

Fig. 4 Examples of multimedia content in the Virtual Learning Environment



The 3D Virtual RES Park offers an environment that allows shifting the traditional educational process (book/textbook) to the new way of learning that is interactive and more visual (Fig. 5). Virtual reality offers an attractive and effective way of learning where students can learn through experimentation and interactions in the virtual world.

Fig. 5 The virtual world gives students the ability to communicate with other students or interact with the objects

The AVARES 3D RES Virtual Park consists of:

- The 3D Auditorium - trainers giving lectures in the 3D Auditorium will be able to load specific presentations from the VLE or even upload their own slides.
- Sub-Areas dedicated to each course - for each one of the five main learning topics (Solar, Water, Wind, Geothermal, and Biomass) there is a designated area inside the world with the corresponding training material along with interactive 3D models that will help them comprehend the presented topics.
- Classrooms/Meeting Rooms - these rooms can serve as meeting areas for project partners and as classrooms for small groups of students as well.

The learning materials stored in the VLE (Moodle) are available in the 3D RES Virtual Park as well. Specific activities and presentations can be displayed as posters or boards at various areas of the 3D Virtual RES Park. Trainers/teachers can give their lectures in the 3D Auditorium where they are able to load learning materials from the VLE or even upload their own slides.

4. Summary

At the present time multimedia, information and mobile technologies or virtual reality actively intervene into the educational process. As technologies change the society, they change the education and training systems as well. This article presents a way how to use multimedia, virtual reality, Web 2.0 technologies and innovative methods of learning and shift them efficiently and attractively from the traditional book/textbook paradigm to a new way of the digital learning content in the education process.

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Lifelong Learning Programme

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Mathematics and statistics in global education

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Abstract
Education, aimed at more thorough understanding of diversity and inequality in the world and at the causes of their existence and possible solutions to problems associated with them, is called global education. This new educational approach is gradually being implemented at all levels of education in order to bring about changes in attitudes towards these phenomena and processes in the global world and encourage solving global problems. Its implementation into courses at universities is necessary since university students are expected to have competencies that allow them to see phenomena and processes in a global environment and actively help them to solve problems in the global world. Since a relatively simple mathematical apparatus can reveal various and complicated social and economic processes, its implementation into subjects of mathematics and statistics is inevitable. The use of mathematical and statistical methods allows not only a detection of the occurrence of certain phenomena in the new global environment, but indirectly calls for particular attention. In the paper we present some problems that could serve as suggestions for the use of mathematics and statistics in training university experts for practice in a global environment.

Key words: *global education, mathematics, statistics*

JEL Classification: *C020, I23, I210, I240*

1 Introduction

The role of educational institutions in university graduates training in new global space is indisputable. Their role is to respond to the new challenges of globalization and perform graduates training in order to facilitate their successful implementation in the new global environment.

Global social problems must be understood in wider contexts of education, hence pupils and students need to acquire those values upon which they can not only understand these problems, but also to take responsibility for solving them, try to mitigate the adverse effects of globalization or to implement the necessary changes, etc. We consider relevant the training of future professionals in various fields of science who can use mathematical knowledge and knowledge of statistics not only in solving specific tasks in the field of science, but also in the wider social context. By means of quantitative indicators they can detect and then solve tasks of analytical character, such as government and economic organizations as well as business and financial organizations. Mastering of mathematical knowledge and knowledge of statistics will allow them not only to see phenomena and processes in the global environment together, but this knowledge enables them to actively approach to problem solving in the global world. The use of a simple mathematical apparatus can disclose a variety of complex social and economic processes to these students. Except for that specialized subjects provide necessary education in the conditions of the new global environment, we consider useful to extend and complement this knowledge with mathematics and statistics.

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2 Data and methods

Global education means education that leads to deeper understanding of the diversity and inequality in the world, to the causes of their existence and to troubleshooting possibilities associated with them. It interconnects education with everyday life. Global development education includes education on issues of developing countries, global poverty, environmental education, multicultural education, peace education, as well as human rights education in a global context (National Strategy for Global Education for the period 2012 - 2016, p. 1). This kind of education should increase awareness of global issues, deepen the understanding of this phenomenon and develop critical thinking. It should help students realize its position and role in the world. We live and work in a world where we are united by a free flow of information, finance and also with people who live in distant countries. Every day we make many decisions about what we eat, what we dress, how we travel to work or school, etc. These decisions affect not only us, but also people who grow the food that we consume every day, people who sew our clothes, produce vehicles. We decide as well about the direction of international development, policy and the ways of economic development, better quality of life, how to deal with the environment (Šebeň Zaťková, 2014). For students of colleges and universities, it is desirable to acquire competencies that enable them to see phenomena and processes in a global environment of mutual relationships. We agree that "at the Slovak economic faculties it is essential to acquire the latest knowledge and skills necessary for successful future economists in the world market, but it is not enough." (Svitačová, 2013, p. 32).Young people in today's world will have to cope not only with various problems and situations whose solution requires competence and knowledge not only of the economy but also of management and other key scientific areas. Their successful participation in the global economic and social environment assumes to obtain at least basic knowledge and skills of mathematics.

"Many people use mathematical models of thinking, logical or spatial, they also use presentations, various charts, tables, formulas, models, diagrams used mainly in statistics. Therefore teaching of mathematics and statistics must be performed in order to enable students to acquire new knowledge by means of problems with diverse context, mainly from real life, to enable them to form simple hypotheses and investigate their veracity, to teach them how to properly present the mathematical contents by texts, spreadsheets, charts, diagrams, and to develop their ability to orientate themselves in plane and space. Mathematics is intended to help develop their algorithmic thinking, ability to work with instructions and create them." (Pechočiak, 2013, p.73) By means of simple mathematical relationships, various charts, diagrams and tables it is possible to explain various difficult social and economic processes. We also meet with the fact that not only students, but often educated people cannot work with fractions and percentages, often confuse the millions and billions, etc. Therefore, we think that mathematics with its apparatus is belongs to the basic and general education. In university and higher education there is paid little attention to global education in mathematics. Much more attention is paid to this new educational approach at primary and secondary schools. Therefore we decided to propose a few problems that could serve as a demonstration and suggestion for the use of global education in mathematics at colleges and universities. Teachers together with students can at mathematics and statistics lectures and seminars solve tasks which include topics on global education. Very current topics of today is the international migration, poverty, debt, multicultural relations, use of languages, application of human and civil rights, democracy, energy issues etc.

By means of mathematics it is possible to reveal the global dimension in situations and processes that take place in the new global environment. By quantitative mathematical and statistical methods it is possible to explain phenomena and processes in the global environment, the characteristics of global problems, to highlight their frequency, intensity, variability etc. or to draw attention to their prevalence and diversity. The implementation of the global dimension

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into mathematics should enable students to acquire new knowledge through solving mathematical problems related to the situation in the global environment.

We have used the basic maths formulas and calculations as well as methods of maths descriptive statistics in the contribution.

3 Results and Discussion

Now in a few examples we present the possibility of the implementation of global education in mathematics and statistics. In the first example we show the impact of globalization on the use of languages in daily life. Today 2500-5000 languages are spoken in the world. We do not know exactly because even linguists often cannot distinguish languages from dialects, some languages extinct as nations and tribes mingle, others arise. Languages can be differentiated according to various aspects, such as according to accords and discords of language syntax and semantics, but most often according to the origin.
In 1990 (World Languages, s1) the most used languages in the world, meant as a native language, included these 10 (without arrangement): English, Russian, German, Spanish, Chinese, Arabic, Portuguese, Japanese, Hindi and Bengali. Table 1 lists the number of people who speak them. In mathematics, these data can be used to practice basic mathematical operations, calculating fractions, percentages and so on. In statistics, for example, we can practice drawing different types of graphs, calculate averages and other statistical parameters.

Table 1: 10 most used languages of the world with the number of people

Language	Number of people in millions
English	330
Russian	160
German	91
Spanish	265
Chinese	1 095
Arabic	190
Portuguese	155
Japanese	125
Hindi	250
Bengali	170

Source: Languages of the world.

1. Problem. Create a decreasing order of the languages according to the number of people who speak them. Create a graph from the table. Find out what part of people in this sample speak English.

Solution: In Table 2, we have arranged the languages spoken by the number of people in decreasing order, and in Figure 1 there is a graphical representation of such arranged languages.
Table 2: 10 most used languages of the world with the number of people arranged in decreasing order

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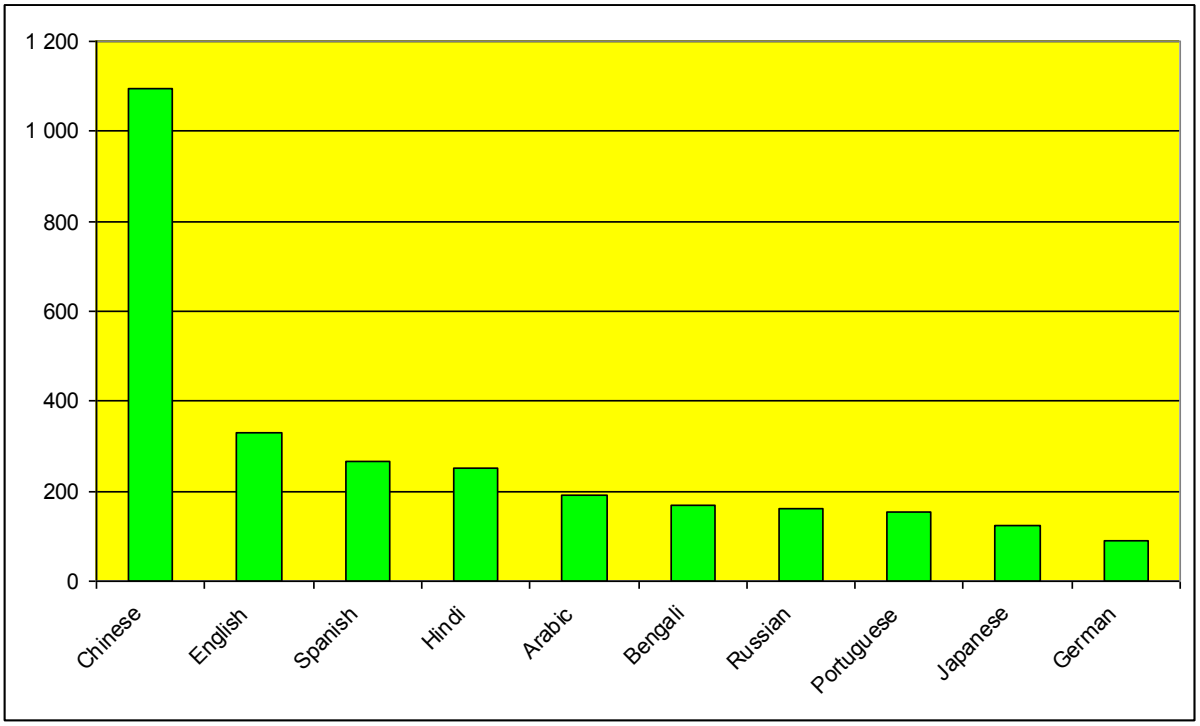
Language	Number of people in millions
Chinese	1 095
English	330
Spanish	265
Hindi	250
Arabic	190
Bengali	170
Russian	160
Portuguese	155
Japanese	125
German	91

Source: own

Figure 1: Graphical representation of 10 most used languages of the world with the numbers of people



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In order to solve the third part of the problem we have to sum up all numbers of people who speak these 10 languages:

$$s = 1095 + 330 + 265 + 250 + 190 + 170 + 160 + 155 + 125 + 91 = 2831. \qquad (1)$$

Now we the number of English speaking people by this sum:

$$p = \frac{330}{2831} \doteq \frac{117}{1000}, \qquad (2)$$

Hence English is spoken by approximately 0.117 people from the given sample, which is 11.7 % people from this sample.

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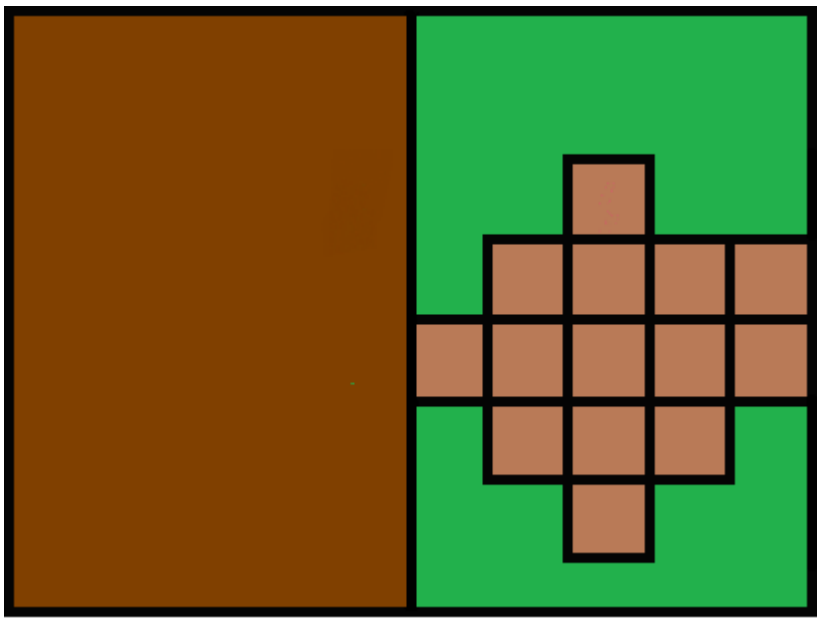
We note that English, even though identified as a native language by only 330 million of people, is becoming the most widely used language of communication in the world.
Another topic of global education is agriculture. It belongs among one of the most important industries. It includes two basic sectors: crop and livestock production. Their function is to produce products required for feeding the population and also those which serve as raw materials for industry. The agricultural sector employs a significant number of working population of the world, especially in less developed countries. Farmers themselves equate land to one of the most precious metals - gold. The rapid soar in land prices implies rising food prices. The area of the agricultural land in the world is more or less constant, it cannot be indefinitely increased. The value of the land has rapidly increased in the recent years and has reached historical maxima. The soil therefore becomes a strategic production item.
In connection with a land area students could solve the following tasks. Figure 2 shows a plot of land with side lengths of 400 m and 300 m. Inside of the plot, in the right half is an ornamental garden, which the owner divided into squares with sides of 40 m, while in the corner of each square he placed a tree or a shrub.

Figure 2: Plot with an ornamental garden



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2. Problem: What part of the plot is taken by the ornamental garden? How long fence would the owner need and what would it cost if he wanted to enclose the ornamental garden, if 1 m (meter run) of fencing mesh is 1.2 €? How many kilograms of seed needs the owner to buy if he wants to seed grass around the ornamental garden if 10 m^2 consumes 20 *g* of seed (Fig. 2).

Solution: We calculate the area of the whole plot P_1:

$$P_1 = a \cdot b = 400m \cdot 300m = 120000m^2. \tag{3}$$

Now we calculate the area of the ornamental garden. The garden consists of 14 identical squares with sides of 40 *m*. Hence its area P_2 is

$$P_2 = 14 \cdot c^2 = 14 \cdot (40m)^2 = 22400m^2. \tag{4}$$

We divide the area P_2 by the area P_1:

$$\frac{P_2}{P_1} = \frac{22\,400}{120\,000} = 0.1867 \approx 18.67\%, \tag{5}$$

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So the ornamental garden takes 18.67 % out of the total area of the plot.

In order to solve the second part of the problem we count the number of the sides of the squares which form the ornamental garden and multiply it by 40. This way we find the perimeter of the garden O, so

$$O = 20 \cdot 40m = 800m. \tag{6}$$

Since 1 m of fencing costs 1.2 €, we multiply the perimeter by this number

$$c = 800 \cdot 1.2 = 960. \tag{7}$$

The owner needs 800 m of fencing to enclose the garden and it will cost 960 €.

Now we solve the third part of the problem. Since the area of the whole plot is 120 000 m^2 and that of the ornamental garden is $22400m^2$, the area of the grass is

$$P_3 = (120000m^2 : 2) - 22400m^2 = 37600m^2. \tag{8}$$

Seeding of 10 m^2 of grass requires 20 g of seed, so 0.002 $kg.m^{-2}$, we multiply the area P_3 by 0.002:

$$m = 37600 \cdot 0.002kg \doteq 75.2kg, \tag{9}$$

Hence the owner needs 75.2 kg of grass seed.

4 Conclusions

We can find a wide variety of similar fields and topics engaged in global education, such as poverty and inequality, health, nutrition, conflicts in the world, development goals, humanitarian aid, education towards human, civil and children's rights, gender equality, governance and democracy, multiculturalism, that could be used in mathematics and statistics,

Students should understand the interconnectedness of developed and developing countries and their mutual interaction. Economic globalization, trade, business ethics, sustainable development, as well as migration are fundamental concepts of global education. Young people should be able to identify themselves in culture, tolerate cultural differences; they should be able to lead intercultural and interreligious dialogue, to handle the concepts of racism, intolerance, xenophobia and various prejudices. An important component of global education is environmental education. Climate change, pollution of air, water and soil, waste management, but also the use of natural resources, creation of alternative energy sources should be the topics encountered by students in the learning and educational process.

Mathematics and statistics are subjects in which we can discuss problems of global education. Education in mathematics and statistics is based on a realistic approach to the acquisition of new knowledge and to the use of manual and intellectual activities for developing of a variety of different skills. Very important is the application of mathematical and statistical knowledge in real situations. In this way students acquire the knowledge and skills of a new quality, which should be present in the entire mathematical and statistical education and create preconditions for further study of mathematics and statistics as well as for lifelong learning.

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Competence requirements of employers to graduates of agro-engineering universities (specialties)

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Abstract
According to the conducted research and expert estimations, in order to form the required adequate competences of potential workers, the graduates should know and be able to apply the received fundamental scientific, socio-economic and agro-engineering knowledge as a basis for professional activities, should have the experience of using universal methods of engineering analysis, intelligent technologies and methods of computer analysis in solving complex engineering problems in agricultural production.
However, the involvement of individual employers cannot be considered as a sufficient measure for assessing the quality of higher education, because employers often tend to judge the quality of graduates in terms of a particular sphere of activity, profession, occupation, or even their own company. It is therefore necessary to involve the public employers' organizations.

Keywords: *agricultural engineering, competence, education quality criteria*

JEL classification: *A29*

1. Introduction

The criteria for assessing the quality of engineering education, used in public and professional accreditation of educational programs in engineering and technology in universities in different countries are currently defined by two authoritative bodies – Washington Accord (http:// www.washingtonaccord.org) and the European Network for Accreditation of Engineering Education (ENAEE) (http:// www.enaee.eu).The Association for Engineering Education of Russia (http://www.ac-raee.ru) is a signatory of Washington Accord and a member of ENAEE. It provides accreditation of educational programs for bachelors, masters and graduates of Russian universities in engineering fields and professions in accordance with international criteria. We propose to include a number of requirements (competency) also in the specific criteria for assessing the quality of agricultural engineering education.

With reference to particular employer, the graduate must demonstrate specific competencies associated with the unique challenges of agriculture, objects and types of innovative engineering in the field of agricultural specialization (research, industrial and technological, organizational, managerial, engineering and others.) in agricultural enterprises and organizations, which support agricultural production (sales and maintenance of equipment, supply of relevant agents, research institutes, etc.), as well as the willingness to follow their corporate culture.

The requirements of the employer to the graduate vary depending on the industry branch and the legal form of the company. However, any employer pays attention to the following factors: knowledge, professional and personal qualities, health, references, and additional skills. As to other knowledge and skills, the employer is ready to provide them to his employee if the latter has relevant potential in place.

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2. Data and Methods

Among other competencies of university graduates a major one is the employer orientation. It means the graduates need to demonstrate specific competencies associated with specific tasks, objects and kinds of innovative engineering activity in agricultural enterprises in general, and in individual organizations, in particular (with potential employers).

To develop this competence at the appropriate level, the graduates need to gain experience in practical application of the following knowledge (Chuchalin, 2009):

- areas of expertise (research and development, production, management, design) in comprehensive and innovative engineering activity in enterprises and organizations (potential employers);
- the overall strategy, regulatory documents, technical and technological status and development trends of enterprises and organizations (potential employers);
- organizational (corporate) culture of enterprises and organizations (potential employers).

The Ministry of Education and Science of Russia recognizes the need to consolidate the role of employers in the educational process – to involve them aslecturers, supervisors of practical training and graduate work, the members of State Examination Boards – these may be called the standard roles. According to most Federal State Educational Standards (FSES) (http://минобрнауки.рф) the share of employee from among top managers and specialists of organizations, i.e. potential employers, should be no less than 10%. The inclusion of employer's standard roles in the educational process makes it impossible to take into account the requirements of most employers to future professionals.

The wording of general and professional competencies for directions and specialties assumes their coordination with the labor functions specified in existing professional standards. However, amended FSESes offer generalized definitions of competencies, including professional ones. To understand them and to further fill them with specific skills and knowledge it is necessary to carry out extensive work with potential employers. This work includes not only questioning of employers, but also explaining what the competencies are; it should be carried out within a limited time period, ideally - before the training of future specialists starts.

The educational system itself is an inertial one; the higher education programs of different levels, including those for agricultural engineers, last for two to four years. Requirements to the graduates, and consequently, to the competencies, may vary dramatically during the training period, especially for agro-engineering specialties.

On the one hand, the generalized definitions of the necessary competencies provide the freedom in filling the professional competencies with specific skills and knowledge; on the other hand, they do not allow to directly conduct a survey of potential employers in terms of the necessity of teaching a particular competence specified by the standard.

3. Results and Discussion

Following the requirements of FSES, when training the future agricultural engineers, the universities define a set of core competencies (professional and common cultural) for a graduate to possess as a result of successful mastering of educational programs in the field of agricultural machinery and technologies (Order of the Ministry…, 2014). However, to define a set of core competencies is just one of the steps that should be made, but it is not enough for the graduates to successfully achieve the planned learning outcomes. High quality of professional training of a specialist largely depends on the choice of educational technologies. Learning outcomes may be different within the same educational program and depend on the chosen educational technology. The educational process should ensure the active involvement of students that allows to form more efficiently and quickly the necessary professional competence. It seems certain that teacher's qualification as an educator and as

a professional in the taught subject is also an essential element in the achievement of educational process objectives.

In accordance with the FSES in different fields of study, realization of competence-based approach should "provide the widespread use of interactive forms of training (workshops, discussions, computer simulations, business and role-playing, case studies, psychological and other trainings) in the learning process combined with extracurricular work aimed at formation and development of professional skills of students.The framework of training courses should include the meetings with representatives of Russian and foreign companies, state and public organizations, as well as the master-classes of experts" (FSES, 2014). Essentially, interactive forms of training activities are the basis of practice-oriented, problem-oriented and project-based educational technologies.

The share of interactive sessions in the total classroom work under the FSES of higher professional education should be at least 20% in bachelors training and not less than 40% in masters training. However the actual level of implementation of interactive practice-oriented methods of teaching in Russian universities, according to the study conducted by the Association for Engineering Education of Russia, remains low (Status of implementation…, 2013).

Real life application of interactive forms of teaching often conflicts with the system of educational process planning, which remains committed to the traditional teaching methods and forms of organization of educational activities.

The traditional approach to education, which focuses on class-and-lesson training system and is widely applied in technical colleges, unfortunately, does not allow achieving the desired goals (Pokholkov&Tolkachev, 2014; Augusti, 2012). The educational process under this approach basically requires the student's ability to listen and record rather than an active individual work. The most common forms of training are lectures and workshops, which do not provide one of the key elements of learning motivation – involvement of each student in the learning process. Apparent is the necessity for improving changes, primarily aimed at selection of appropriate educational technologies and teaching methods, at enhancement of their effectiveness to develop the creative thinking through transition from teaching to learning, from passive to active methods, from the reproductive activity of students to their individual research and creative work.

High motivation level and involvement of students in the educational process, of course, depends on the teacher's skills especially in the field of interactive teaching methods, his/her ability to organize the educational process with the use of such techniques as brainstorming, expert panels, training, role play, case analysis and others.

Teacher's professional qualification is also determined by the frequency and the duration of his/her practical training on advanced production facilities.This, in turn, allows him/her to expand the range of contacts with the industry representatives and to invite, where appropriate, the experts to participate in classes with students related to the challenging problems of actual production. The possibility to sign economic agreements and to involve the students in addressing realistic production problems plays an important role in this context.

Setting a task to train competitive specialists, the educational software developers need to pay special attention to the content and organizational forms of educational activities.Training should be carried out by competence-based educational programs with interdisciplinary content, modular and student-oriented structure, and with the possibility to introduce individual education plans. The items listed above should be given sufficient attention at the stage of development of the basic educational program (Chuchalin&Boev, 2007; Motajlenko, 2015; Augusti&Feyo de Azevedo, 2011). Applied educational technologies and techniques should help to achieve the planned learning outcomes, providing interactive learning, involvement and autonomy of students, adaptability to challenges of external medium through transforming the students from passive listeners to active figures in educational process.

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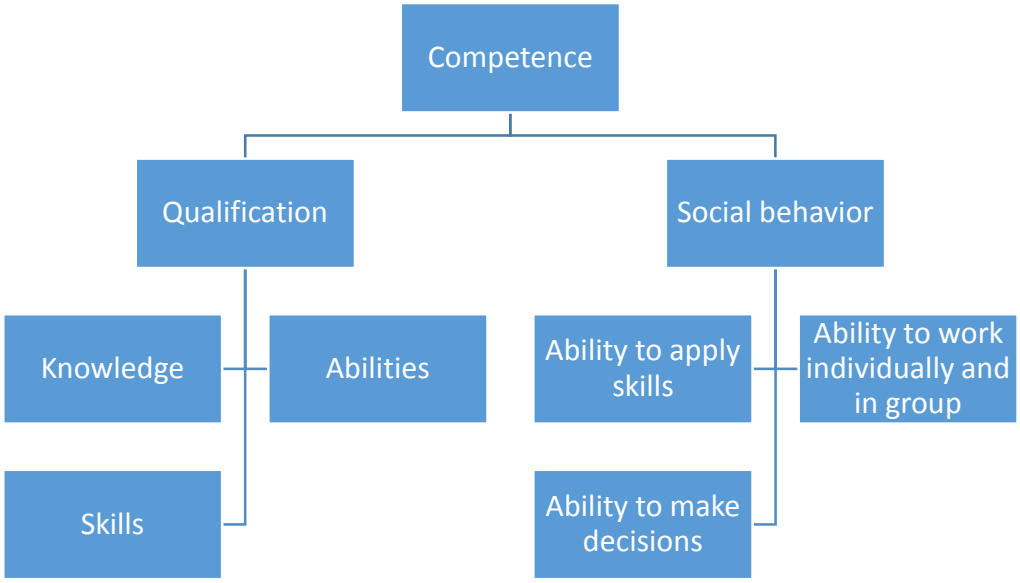
Recently, one of the basic requirements for a graduate of any training level in agricultural engineering schools is a necessary professional competence, which subsequently has to develop into a high level of professionalism. It is understood that the "high level of professionalism" means the competence of a specialist + various kinds of experience related to the profession. Experience comes over time (many confuse this concept with the concept of skill – automatic human performance) but the competence (including skills) an agricultural engineer should receive in the course of training in a high school.

There are many classifications of professional engineering competencies (Chuchalin, 2009; Pokholkov&Tolkachev, 2014; Augusti, 2012). Most scientists have concluded that the competence for an engineer is the sum of qualifications, which are defined by a set of expertise, knowledge and skills, i.e. professional competences and social behavior (Fig.1).

Figure 1: Professional competences of an engineer



For a future agricultural engineer to become a professional person, it is necessary to mould such a consciousness, which would incite to fruitful professional work. Engineer's consciousness becomes truly professional only when he perceives and interprets the engineering activities in the scientific, technical, vocational, qualification and personal terms.

Mapping regulatory requirements and professional standards in the mind allows the engineer to fully and adequately perceive engineering and technical reality, be well informed and develop strategies and tactics, plans and objectives of professional activity, knowingly control his/her own behavior. With their help, the specialist generates the attitude to himself as a professional, and to other participants of production process (agronomist, livestock specialist, and economist).

With the aim to identify the level of theoretical knowledge and practical skills, to improve the quality of agricultural education of graduates in Russia, the questioning of employers, who offer employment to the graduates of agricultural universities, was conducted in the framework of TEMPUS project «Development of Public Accreditation of Agricultural Programs in Russia» (PACAGRO) (Golokhvastov et al., 2015). Period of survey: October-November, 2014, creation and analysis of questionnaires. Number of respondents: 95 people. Regional distribution: 10 regions in Russia (+1 in Republic of Belarus). Profile of organizations of respondents: 75% respondents represented agricultural producers.When assessing the theoretical knowledge of graduates of agricultural universities 404 responses were received. Most frequently evaluated qualifications – mechanical engineer – 13.9%.

Besides answering the proposed questions, the respondents identified the following problemsfor agricultural engineering:

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- Insufficient (poor) knowledge of foreign languages,
- Lower competency of teaching staff and reduced financial support of the training process. Material and technical resources of institutes fail to meet the requirements of modern farming,
- Shortage of practical experience among the specialists who graduated from higher educational establishments.

Strong points: 87% of the respondents noted that specialists engaged in the production are familiar with the advanced technologies and best practices in their field of expertise.

It should be noted that the rules of professional conduct and competence are always concrete. They are produced by people in accordance with the terms and requirements of real life and activity, in accordance with their own ideas. Any young agricultural engineer conceives and interprets the rules worked out in practice, already having some ideas of the proper and valuable.

To estimate the competence of an engineer a "sample competence passport of an agricultural engineer" with the rough description of each competency may be used (Table 1).

Table 1:Sample competence passport of an agricultural engineer

Competence	Description
Planning and organization	Thoroughness, keeping papers in order, advanced skills of planning and control over the following of approved plans
Leadership skills	Enthusiasm, ability to inspire other people with his/her ideas, the ability to gain a team leader reputation
Analytical thinking	Active search for new information, the ability to work with various sources, developed skills of survey of problematic situations, the ability to make balanced and viable decisions under conditions of uncertainty
Cooperation	Sociability, aspiration to understand the needs and desires of others, the ability to achieve a breakthrough in the negotiations
Teamwork	Developed skills of social networking, maintaining good relations with all team members, mutual aid
Results-based approach	Adherence to the established quality standards, insistence in negotiation of obstacles, ambitiousness
Open-mindedness	Positive attitude to innovations, active search for new agricultural technologies and opportunities
Professional skills	High level professional knowledge, abilities and skills, good understanding of the tricks of the profession, clear awareness of the boundaries of his/her professional activity, continuous update of knowledge and skills in the professional field (machinery and technologies), the interest in related professional fields (agronomy, animal science, etc.)
Independence	Reasonable self-esteem, self-reasoned opinion on important issues
Communication	Verbal intelligence, good command of emotional and expressive oral speech tools
Writing skills	Good command of written language, informative presentation of his/her ideas in writing
Ethical norms	Strict adherence to professional and universal moral norms
Creative ability	Active generation of new ideas and creative approach to their execution

4. Conclusion

In order to form the required adequate competences of potential workers, the graduates should know and be able to apply the received fundamental scientific, socio-economic and agro-engineering knowledge as a basis for professional activities; they should have the experience of using universal methods of engineering analysis, intelligent technologies and methods of computer analysis in solving complex engineering problems in agricultural production.

The involvement of individual employers cannot be considered as a sufficient measure for assessing the quality of higher education, because employers often tend to judge the quality of graduates in terms of a particular sphere of activity, profession, occupation, or even their own company. It is therefore necessary to involve the public employers' organizations.

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Evaluation of the indicators of professional public accreditation of agricultural study programs

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Abstract
The article discusses the results of the analysis of the accreditation indicators used in the quality assurance systems of Russia and Europe. The indicators of professional public accreditation of agricultural programs were developed based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) within the TEMPUS Project «Development of Public Accreditation of Agricultural Programs in Russia» (PACAgro). The indicators provide for the implementation of requirements and employers' participation in the evaluation of study programs.
The article describes a list of indicators and introduces the methods for their assessments. A system for the indicators' assessment when conducting external and internal review during professional accreditation of study programs was developed based on the scale grading from 0 to 3 points.

Keywords: *accreditation, agricultural programs, external and internal review, indicators, assessment methods*

JEL Classification: *I21, I23*

1. Introduction

In the Russian Federation the labor market impact on the system of higher education has been until recently limited; there was a significant gap between the content of education, which was established by the Ministry of Education of Russia, and employers' needs. In 2013 in light of the higher education system reform the Law on Education in the Russian Federation was adopted. It prescribed greater involvement of employers in the work of higher education institutions (HEIs), as well as in the system of external quality assurance of education (Self-Evaluation Report of the National Accreditation Agency, 2015). The legislation introduced the concept of "professional public accreditation", which enables employers to significantly influence the content and quality of education, to establish their own requirements, which makes the graduates of HEIs with such accreditation more competitive in the labor market. As part of this concept, the system of professional public accreditation of the agrarian sector in the Russian Federation was created and is being implemented in practice within the TEMPUS Project (Development of Public Accreditation of Agricultural Programs in Russia, 2016).

One of the main challenges here is to develop a list of indicators that allows for adequate and objective assessment of study programs in terms of their compliance with the requirements established in the framework of accreditation. Indicators used in any system of accreditation of study programs are its basic element, and determine the content of internal and external evaluation (Petropavlovskiy, M., Smelik, V., Nefedova, O, 2015).

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2. Data and Methods

The indicators of professional public accreditation of agricultural programs were developed with due regard to the approaches defined by the Standards and Guidelines for Quality Assurance in the European Higher Education Area, (ESG) 2015. In addition, the analysis of the indicators used by the agencies carrying out accreditation of study programs in Spain (Catalan University Quality Assurance Agency, AQU Catalunya), Germany (Agency specialized in accreditation of engineering programs, ASIIN), as well as some Russian accreditation agencies (Association for Engineering Education of Russia, OPORA RUSSIA) was conducted.

The results of the analysis shown in Table 1 allow for the conclusion that the majority of Russian and foreign agencies use indicators (or accreditation standards), which can be grouped as follows:

1) study program;

2) students and graduates;

3) academic staff;

4) facilities and resources;

5) organization and management.

Table 1: Comparison of the indicators used by Russian and foreign accreditation agencies

Name of the indicator	Association for Engineering Education of Russia	OPORA RUSSIA	ENQA	AQU Catalunya (Spain)	ASIIN e.V (Germany)
1. Study program	+	+	+	+	+
2. Students and graduates	+	+	+	+	+
3. Academic staff	+	+	+	+	+
4. Facilities and resources	+	+	+	–	+
5. Organization and management	+	+	+	+	+

The developed indicators should take into account the requirements of employers, as in accordance with the Russian legislation "professional public accreditation of professional study programs is the recognition of the quality and level of training of graduates who have mastered such a study program in a particular organization, carrying out educational activities, to meet the requirements of professional standards, the requirements of the labor market to specialists, workers and employees of the relevant profile".

3. Results and Discussion

3.1 Content of the Indicators of Professional Public Accreditation of Agricultural Study Programs

It is suggested to use the following set of indicators when carrying out Professional Public Accreditation of Agricultural Study Programs.

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Indicator 1. Study program

– *participation of employers in the educational program development and updating:* the study program is regularly updated. The improvement of curricula, syllabuses of disciplines (modules), practice and research programs, state final examination are carried out with the involvement of employers. There is a system of interaction between an educational organization and employers, labor market representatives and other organizations (agricultural enterprises, organizations, agribusiness authorities, suppliers of goods and services of the agricultural sector).

– *structure and content of the study program curriculum provide for the achievement of competences and conferred qualifications:* the study program trains students for effective and responsible work in the profession in accordance with the labor market needs. The implementation of the study program curriculum ensures the achievement of the established competencies and conferred qualifications.

– *system for assessing learning outcomes:* procedures for assessing the level of students' knowledge/competences are documented, based on clear criteria and designed in accordance with the intended learning outcomes. The fund of assessment tools meets the requirements of professional standards developed and approved by the Ministry of Labor of RF as regards employment functions, actions and labor-market skills. The results of students' technical training are assessed by employers during professional certification.

– - *efficiency of the applied teaching methods:* the applied teaching methods are well grounded and contribute to the achievement of the established competencies. The educational process includes methods of on-line training aimed at developing student professional competences (technology for solving professional tasks, lectures-visualizations, problem-based lectures, training of professional competences, information communication technologies and etc.).

– *teaching and learning support of the study program:* teaching and learning support is focused on the established learning outcomes, corresponds to the required quantity and quality. Teaching and learning aids are developed with the involvement of employers and/or have a critical review of employers.

– *graduate qualification works, scientific research projects:* the theme-subject of graduate qualification works and scientific research projects allow for assessing the level of formation of professional competences. Requirements for their implementation are consistent with the level of competences and qualifications conferred. Questions and tasks are designed to meet the specific requests of employers.

– *providing the implementation of curriculum and its improvement:* the monitoring of the curriculum implementation is systematically carried out when delivering the study program, the monitoring results are used for its improvement.

Indicator 2. Students and graduates

– *level of knowledge /competences of students and graduates:* the level of knowledge/competences meets professional standards.

– *student support services:* students have the opportunity to use student support services, including academic advising and counseling, as well as the existing career guidance services aimed at helping students in the right career choice and employment at agricultural enterprises.

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– *employment of students:* there is a system for tracking professional career paths of graduates. The reliable data on students' employment at agricultural enterprises over the past three years is published at the web site of the educational organization. Level of graduates' employment.

– *satisfaction of employers:* the proportion of partners – employers satisfied with the results of training (measured by the results of surveys conducted among employers of agricultural enterprises).

– *satisfaction of students:* the proportion of students satisfied with the actual learning outcomes and the work of student support services (measured by the results of surveys conducted among students studying the program under accreditation during external review).

Indicator 3. Academic staff

– *compliance of the academic staff qualification and number to the curriculum:* academic staff (hereinafter - the AS) have the education appropriate to the taught disciplines. The proportion of teachers with academic degrees and titles, as well as professional experience in the area specific to the taught discipline, meets the requirements set by the established standards.

– *involving employers in teaching:* representatives of large agricultural enterprises are engaged in teaching. The educational organization provides for their instruction, guidance, monitoring and evaluation of their activities.

– *professional development of teachers:* teachers undergo professional development training not less than once in 5 years at modern agricultural enterprises, scientific research institutes of the agrarian sector, participate in agro exhibitions, conferences, symposia, and so forth.

– *availability of the system for diagnosis and motivation of the academic staff:* the educational organization has a system to stimulate AS. The quality of each teacher's performance is regularly evaluated, and the results are used to motivate AS.

Indicator 4. Facilities and resources

– *provision of the educational program with classrooms, laboratories and equipment:* the educational program has an adequate number of classrooms, laboratories and equipment in accordance with the curriculum requirements.

– *improvement and enlargement of facilities and resources:* facilities and resources are constantly updated and improved in accordance with the requirements of the agrarian sector of economics.

– *engagement of employers in providing the necessary base for the implementation of the educational process:* employers take part in updating facilities and resources of the educational organization. Employers provide their premises for training and scientific practices of students.

Indicator 5. Organization and management

– *management of the study program:* the organizational structure of the program management is effective. The management process is aimed at improving the study program. Teachers, employers and students are involved in the decision-making process in accordance with their areas of responsibility.

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– *availability of the system for collection, analysis and use of the information when managing the educational program:* there is a system of key performance indicators in relation to the departments responsible for the program delivery. The opinion of employers of agricultural enterprises, students and AS is taken into account when evaluating the performance of departments.

3.2 Assessment of the Indicators of Professional Public Accreditation of Agricultural Study Programs

When conducting external review it is suggested to use a four point grading scale for each criteria unfolding the indicators' content. For example, in order to assess the employers' involvement in the development and updating of the study program (Indicator 1. Study program) the following grading scale is used:

0 point – no documents proving the availability of the study program are presented;

1 point – the study program is developed and annually updated;

2 points – the study program has a referee report or reference from at least two leading employers of the region;

3 points –availability of the document describing the program development strategy for the next 4-6 years; program development strategy is line with the prospects of development of the regional (federal) labor market, trends within the areas of agricultural program training; the study program is developed in conjunction with the leading agricultural organizations in the region or has references/referee reports from them; syllabuses of study disciplines (modules) have expected learning outcomes agreed with the key partners representing the regional labor market.

Teaching and learning support of the study program (Indicator 1) is analyzed in terms of the following:

- teaching and learning aids are developed for all disciplines, practices, types of classroom hours and etc. in accordance with the program structure and content and can be used in all education delivery modes realized within the program;

- there are mechanisms for updating teaching and learning aids with regard to the changing conditions at federal, regional and local labor markets;

- teaching and learning aids are available for students in the internal information system;

- teaching and learning aids are handy and encourage students for further self-education and independent work;

- teaching and learning aids are developed with the involvement of employers-organizations interested in graduates' employment.

Objective information on graduates' employment (Indicator 2) is posted on the monitoring web site of the Ministry of Education and Science of RF (http://graduate.edu.ru/) and may be used as one of the information sources for the assessment of the corresponding criteria of the indicator.

The satisfaction of employers and students (Indicator 2) is assessed according to the results of everyday questionnaire surveys conducted within the TEMPUS project PACAgro (Horská, E., Petropavlovskiy, M., Nefedova. O., Smelik, V., Dobrinov, A., Ovchinnikova, E., 2015).

Level of knowledge/competences of students and graduates (Indicator 2. Students and graduates) is assessed by the results of their professional certification expressed in a percent of students and graduates who has been awarded a corresponding professional certificate.

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In order to assess the level of students and graduates' competences, employment of graduates of the study programs, satisfaction of employers and students it is suggested to use a quantitative grading scale as well:

0 point – indicator value from 0 to 70%;

1 point – from 70 to 80%;

2 points –from 80 to 85%;

3 points – indicator value over 85%.

The final assessment of each indicator as a whole is formed by summarizing the points given by experts with regard to all content criteria. The final indicator assessment is positive if it constitutes over 50% points for all criteria:

Table 2: Number of criteria and points for the assessment of Indicators of Professional Public Accreditation of Agricultural Educational Programs

Indicator	Number of the indicator criteria	Maximum number of points for the indicator assessment	Number of points for the positive indicator assessment
Indicator 1. Study program	7	21	11
Indicator 2. Students and graduates	5	15	8
Indicator 3. Academic staff	4	12	6
Indicator 4. Facilities and resources	3	9	5
Indicator 5. Organization and management	2	6	3

Positive decision on accreditation of the study program within professional public accreditation of agricultural programs is possible when all indicators are positively assessed, conditional decision — when 4 indicators have positive assessment, in all other cases the program is considered not accredited.

The assessment criteria and decision rules are suggested to be tested in 2016 during accreditation of study programs delivered by Russian HEIs-project partners: Saint-Petersburg State Agrarian University, Russian State Agrarian University - Moscow Timiryazev Agricultural Academy, Kabardino-Balkarian State Agricultural University named after V.M. Kokov, Kazan State Agricultural University, Mari State University.

4. Conclusion

A list of indicators for carrying out professional public accreditation of agricultural programs at HEIs has been developed within the study framework allowing for the employers' influence on the content and quality of education. In order to assess the indicators a scale from 0 to 3 points has been introduced and a methodology of peer review for each indicator has been developed. It was suggested to use the model of integration of the indicators' assessments for making a decision on accreditation or refusal of accreditation of the study program being evaluated.

Acknowledgements

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Retrospective view on teaching the Slovak language at the Slovak University of Agriculture in Nitra

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Abstract
The paper deals with teaching Slovak at the Slovak University of Agriculture in Nitra with the emphasis on the period 2000 to 2016. It provides an analysis of this period in different areas – courses, teaching methods, teaching materials, an interest of students and their academic performance, the impact of research activities on the educational process and international relations – using archive materials of the Department of Foreign Languages, the Rectors office and the authors own materials. At the same time it points out the relations between these areas, their interaction as well as the tendencies and perspectives of the Slovak language.

Key words: *courses, evaluation and tendencies, international cooperation, number of students, research work, study results, teaching Slovak language, textbooks*

JEL classification: *I23*

1. Introduction

The department of Languages at the Slovak University of Agriculture (SUA) in Nitra was founded in 1952 and was initially managed directly by the Rector. After several reorganizations, it was affiliated to the Faculty of Economics and Management (FEM) in 1959. The department has undergone many personnel and structural changes, so changing the name into the Department of Professional Language Education in 2002, and consequently return to its original name in 2012 can be considered only a detail. In the beginning, teaching was focused primarily on the Russian language; other non-Slavic languages – English, German, French and Spanish - followed afterwards. The arrival of foreign students at the SUA raised the need to teach Slovak as a foreign language. The first teachers of Slovak as a foreign language were doc. PhDr. Ľudmila Jančovičová, CSc., Mgr. Emília Rákošiovaá and doc. PhDr. Edita Rohaľová, CSc.

Current model of teaching Slovak for foreigners was set by PhDr. Edita Rohaľová, CSc. in 1990s; our colleague worked at the department until 2007. Later we started two different courses of Slovak for foreigners – General Language and the Slovak Language for Foreigners.

In accordance with other courses taught at the Department of Languages, two-semester courses are to be completed by zapocet at the end of the winter term, and by a final exam at the end of the summer term. After satisfactory progress students receive an adequate number of credits.

Soon after, a one-semester course was introduced – The Basics of Slovak for foreigners- which is completed by a final exam at the end of a term. This course is primarily for those students who come to study at SUA as a part of an exchange programme Erasmus, Erasmus Mundus, etc. These courses were tutored by PhDr. Jana Vrbová, PhD between 2007 – 2010. At present their tuition is divided among qualified teachers as follows: PhDr. Jana Vrbová, PhD - The Basics of Slovak for foreigners; Mgr. Viera Prídavková - courses of Slovak for foreigners – General language and Slovak for specific purpose. Mgr. Zuzana Rebičová, PhD. is currently a guarantee for all courses of the Slovak language for foreigners.

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2. Data and Methodology

The aim of the paper is to look at the position of the Slovak language in the teaching and learning process at the Slovak University of Agriculture in Nitra and how it is managed by the Department of Foreign languages at the university. Based on data collected from written documents of the Department of Foreign languages at the Slovak University of Agriculture in Nitra, the Rectors office, the university information system, and from documents of former teachers of the Slovak language, we have concentrated on the last decades, looking at them from the following perspectives:

- Subjects and teachers
- Used textbooks
- Students and their academic performance
- Research and international cooperation

The important part of the paper concerns the characteristics of students of the Slovak language, to analyse their communication problems in speaking and writing. We go out from the quantitative processing of data on the number of students and their academic performance, and move on to concrete examples. We will evaluate mistakes students have made so they could be placed into logical groups based on common features.

3. Results and Discussion

3.1 Textbooks and teaching material

At the very beginning it was necessary to introduce relevant teaching materials and textbooks. The textbook written by MISTRÍK Jozef: *Basic Slovak*, 1. vyd., Bratislava: Slovenské pedagogické nakladateľstvo, 1981, 151 pp was used to teach the course, The Basics of Slovak for foreigners. In 1990s there were several books for teaching Slovak. Mostly, they were reissued and available on the market, so there was no need to write our own textbooks. The textbook by HOLÍKOVÁ Klaudia a kolektív: *Dobrý deň, slovenčina* + 3 magnetofónové kazety, 1. vyd., Bratislava: Ústav jazykovej a odbornej prípravy zahraničných študentov Univerzity Komenského, 1991 is an example of a really textbook one that was used for a long time.

Homogenous English-speaking groups of students were using the textbook BÖHMEROVÁ, Ada: *Slovak for You: Slovak for Speakers of English – Textbook for Beginners = Slovenčina pre vás: Slovenčina pre anglicky hovoriacich – učebnica pre začiatočníkov.* Perfekt, 1996 (1. vydanie), 1998 (2. vydanie), 141 pp., that was adapted to the needs of English-speaking students and supplemented by a series of audiotapes.

Francophone groups of students were using the textbook BALÁŽ, Peter – SERAFÍNOVÁ, Danuša. *Parlons slovaque ou Les amis de l´internet. Guide pour les étudiants francophones*. Bratislava: Univerzita Komenského, Studia Academica Slovaca, 1999, 143 pp. Later, both the contents and the form were updated.

In recent decades, a scientific theory of teaching Slovak as a foreign language has been developed, mainly due to the collective of Studia Academica Slovaca at Comenius University in Bratislava. A practical outcome of their effort is a series of books, which has been prepared according to the requirements of the European Language Framework and divided into levels A1, A2, B1. It includes a Studetns book, Workbook and CDs.

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KAMENÁROVÁ, Renáta a kol.: *Krížom krážom. Slovenčina A1* + CD. Bratislava: Univerzita Komenského v Bratislave, Studia Academica Slovaca, 2007. 190 pp.

KAMENÁROVÁ, Renáta a kol.: *Krížom krážom. Slovenčina A2* + CD. Bratislava: Univerzita Komenského v Bratislave, Studia Academica Slovaca, 2009. 210 pp.

KAMENÁROVÁ, Renáta a kol.: *Krížom krážom. Slovenčina B1* + CD. Bratislava: Univerzita Komenského v Bratislave, Studia Academica Slovaca, 2011. 254 pp.

IVORÍKOVÁ Helena a kol.: *Krížom krážom. Slovenčina A1 + A2. Cvičebnica.* Bratislava: Univerzita Komenského v Bratislave, Studia Academica Slovaca, 2009. 234 pp.

VAJIČKOVÁ, Mária: *Slovenčina pre cudzincov. Gramatické cvičenia.* Bratislava: Univerzita Komenského v Bratislave, 2005, 2009 and ŽIGOVÁ, Ľudmila: *Slovenčina pre cudzincov. Gramatická a pravopisná cvičebnica.* Bratislava: Univerzita Komenského v Bratislave, 2005, 2009 were designed to practice theoretical knowledge of The Slovak language (mainly grammar).

The important teaching aid is, for sure, an online course of the Slovak language In6enio by authors Mária Užáková and Jana Vrbová.

JANČOVIČOVÁ, Ľudmila: *Slovenčina pre zahraničných študentov VŠP v Nitre*. Bratislava: Príroda, 1979, 90 p. and VRBOVÁ, Jana – RÁKOŠIOVÁ, Emília: *Slovenčina pre zahraničných študentov*. Nitra: VŠP v ES, 1988, 146 p. are the textbooks written by the teachers of the Slovak language to satisfy specific requirements of foreign students at non-philological universities (SUA in Nitra).

In the years to come, the SUA in Nitra stopped issuing its own teaching material for the Slovak language courses. The teachers of Slovak use authentic printed or web material. This should be changed, because although the Internet provides a really big number of material, searching for it, its selection and adaptation to meet demands of teaching Slovak for Specific Purposes requires a lot of time and energy of tutors.

3.2 Students and their academic performance

At this point we should emphasise that this is teaching Slovak as a foreign language, and it is exclusively designed for foreign students. The origin, nature and characteristics of students vary depending on the specific socio-political situation and every time is different. So, we can divide students into several groups:

1. Slovaks living abroad coming mostly from Serbia, Romania, but also from Spain or Bosnia. They are descendants of Slovaks who, have emigrated to those countries and settled there. Some of these students have completed their primary or secondary education in the Slovak language. They can understand Slovak in spoken and written form, but their Slovak is archaic, often marked by a dialect that their ancestors brought to their new homes and has, along with folk customs, preserved until today. They come to our country to study for a Bachelor degree in the Slovak language. These students only enhance general language, because their Slovak is at the same level as the Slovak of those Slovak students who come from different dialectal areas of Slovakia. At the same time they study Slovak for specific purposes - oral presentation of written work, preparing PowerPoint presentation, public speaking, stylistic peculiarities of speech and they learn the difference between an abstract and annotation, summary and conclusion.
2. Students coming from Slavic countries, e.g. from Russia, Poland, Ukraine and Serbia. Some of them have already spent some time in Slovakia or the Czech Republic. They can understand the spoken and, to some extent, the written language, but we can definitely say, that they have not mastered Slovak yet. In their communication they use a mixture of Slovak and their mother tongue, or very often switch into English. Some of these students study in the Slovak language,

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the others in English, so their attitudes towards learning Slovak highly depend on the mentioned fact.

3. Students coming from non-Slavic countries (Spain, France, China, Vietnam, Iran, Afghanistan, Ecuador). These students have completed 1 year of intensive Slovak course at the Institute for Language and Academic Preparation for Foreign Students at Comenius University in Bratislava, where they studied Slovak for about 10 lessons a day. These students are well prepared and are able to undertake the whole Bachelor study programme in Slovak. They are generally highly motivated to study Slovak, show a great effort and responsibility because they are aware that mastering Slovak will help them in their study and understanding of technical subjects.

4. Students coming from different Slavic and non-Slavic countries for 1 or 2 terms as a part of Erazmus or Erazmus Mundus exchange programmes. They study technical subjects in English, and need Slovak language only for day-to-day communication and obtaining ECTS credits.In this group it is important to emphasise the intercultural aspects along with teaching the basis of the language. The department of Foreign Languages at our university has responded to an increased number of these students and offers courses of Elementary Slovak for Foreigners. As we already mentioned, exchange programmes usually last one term, so in the summer term there are new students to come, though that term is generally less busy.

Graph 1 shows the number of students studying the Slovak language. We can see that the number of students in the winter semester and the summer semester slightly differs. In the summer semester there were students (most of them were 1st year students) because the 1st year at the university is generally difficult and requires a lot of study. For international students it is extremely difficult. Change of environment, language and cultural shock, homesickness, high academic demands, etc. cause that some students leave their studies after the first semester. By 2012, the numbers of students of the General Slovak Language course and the Slovak for Specific Purposes course were the same, and then the students started to use the option not to sign for both courses.

Graph 2 shows the average grades for the last decade. The study results are fairly balanced in all courses of the Slovak Language and are relatively very satisfying. The average grade oscillates between 1.2 and 1.5. There are several factors that have an influence on the very good study results of students: high professionalism of tutors, an adequate curriculum and study material in individual courses, and a responsible approach of foreign students who realize that mastering Slovak leads to successful studying at a Slovak university.

Quantitative data do not tell us about problems that international students face when studying our language. These data can be obtained only by a qualitative analysis of their study results - the written language is documented in tests; the evaluation of the spoken language is based on oral exams and presentations.

Graph 1: The Slovak language in years 2007 – 2016

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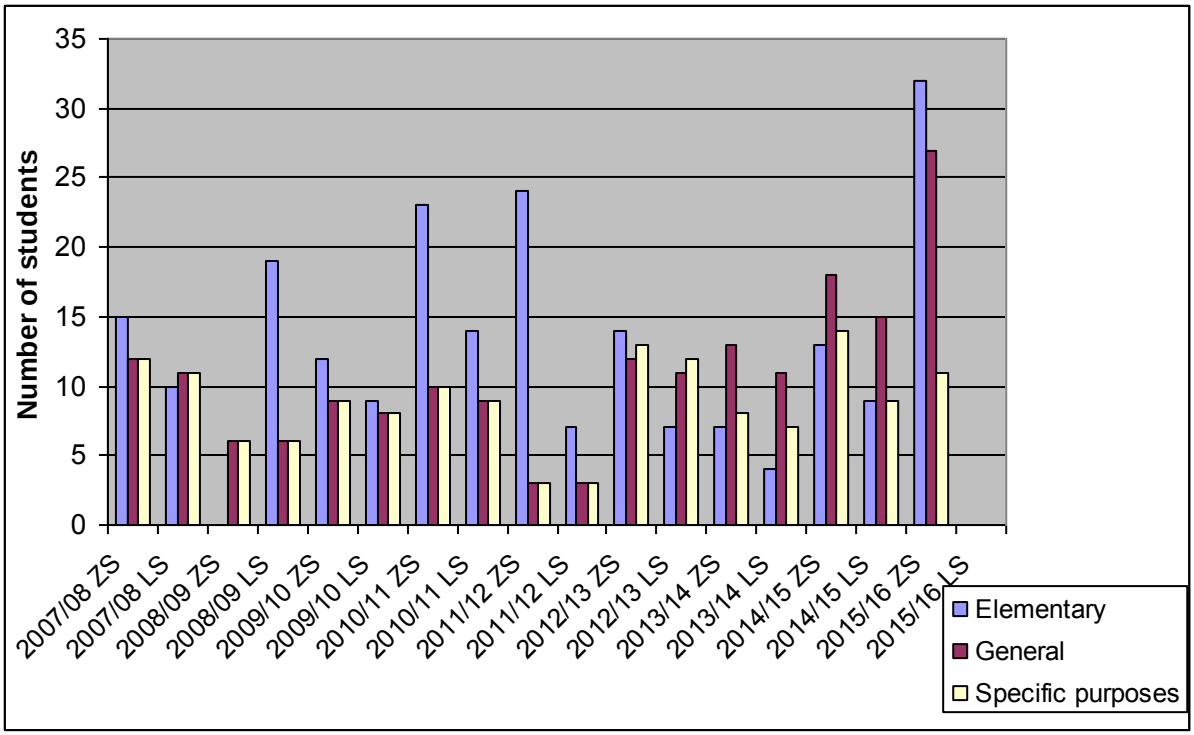
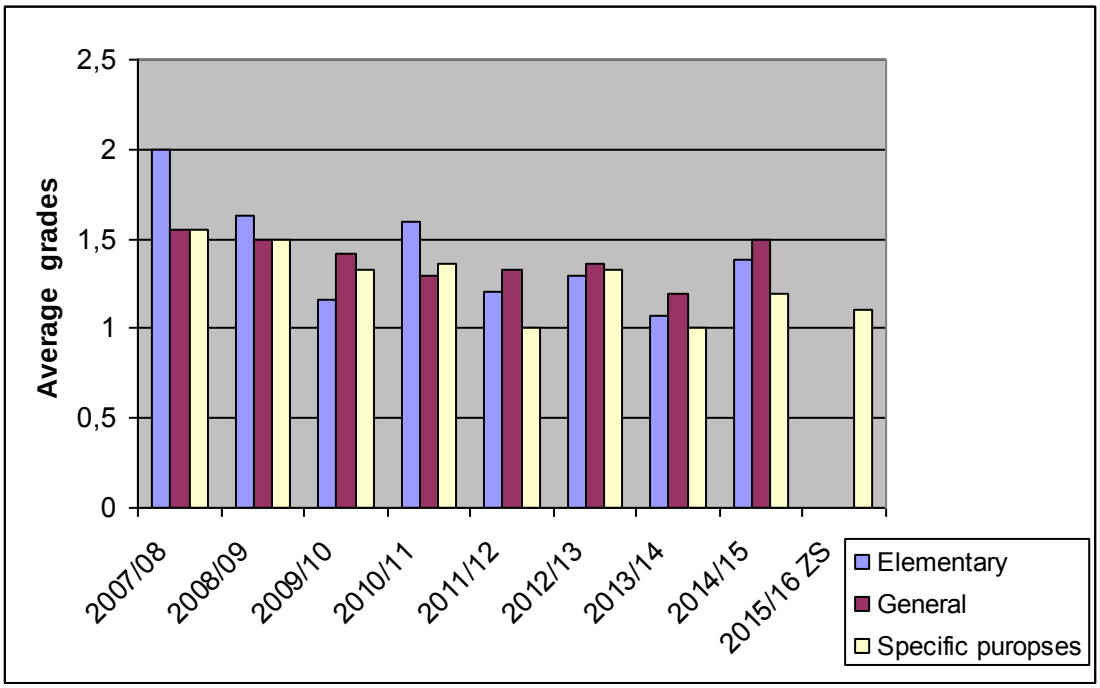


Source: UIS SPU in Nitra

Graph 2: Evaluation



Source: UIS SUA in Nitra

3.2.1 Phonetics and phonology

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Mistakes in speaking are often related to students´ backgrounds and their mother tongue. In a suprasegmental area we often face the wrong accent (not on the first syllable), improper melody of speech (rising melody in declarative sentences), sentence segmentation (breaks in a wrong place, e.g. between a proposition and a noun) and inconsistent articulation, which can cause misunderstanding. There are also many mistakes in pronunciation: improper pronunciation of double consonants, ignoring soft pronunciation of consonants de, te, ne le, di, ti, ni, li. Perhaps, we can mention the fact that many students, who come from countries where Cyrillic is used, read letter y as [u].

3.2.2 Orthography

There are many students coming from countries which use different graphics systems (Cyrillic, Arabic, Chinese characters). These students study our Slovak alphabet and accented letters (á, é, í, ú, š, č, ť, ž, etc.) first. Using accented letters also makes problems for students from Slavic countries, for example Serbs, Croats, Russians and Ukrainians simply because they do not have them in their alphabets. Ukrainian students often write a letter i instead of e - *darčik, musil som, stromčik* instead of darček, musel som, stromčik; Serbian students write h instead of ch - *prihodim zo Srbska, hudobny kraj, Tehnická fakulta* instead of prichádzam zo Srbska, chudobny kraj, Technická fakulta. Slovak students also make some spelling mistakes, e.g. writing i – y, proper using of commas, misuse of prepositions s (Instrumental) and z (Genitive), simple and vocalized prepositions s / so, z / zo, v / vo, k / ku; they confuse case ending - ou (feminine singular instrumental) with the suffix – ov (masculine plural genitive) e.g. *pečenie koláčikou a perníčkou*. English speaking students have problems with the correct use of capital letters in multi-word names *Slovenská Poľnohospodárska Univerzita v Nitre* instead of Slovenská poľnohospodárska univerzita v Nitre.

3.2.3 Lexicology and stylistics

Looking at language issues of foreign students more closely we notice that students coming from Slavic countries face different problems to students from non-Slavic countries. The latter ones have very limited vocabulary and often understand only one meaning of a word, even of an ambiguous word. Even when using dictionaries, they are not able to pick up the correct meaning. Similarly, we see an excessive use of personal pronouns to emphasize a subject in a sentence. These kinds of mistakes are done also by students of Slovak nationality coming from Serbia; they are descendants of Slovak emigrants. Very often they use archaic language or dialect words, which have petrified in areas where they come from - *ešče, všeci, kôli, pokým, mám lem prednášky.* A typical problem is an incorrectly used univerbation (the diachronic process of combining a fixed expression of several words into a new single word), shortening of words, or the use of collocations instead of formal multi-words expressions - *bývam na intráku, cestujem busom, mám cviko z matiky*. Some mistakes are subject to the influence of English, which has promoted as a new „lingua franca“– universal language of communication, e.g. the excessive use of anglicisms and their distorted slovakized words – *kompjuter, spíker, sejvnúť, deletovať*.

3.2.4 Grammar and syntax

Grammatical gender is a problem area for some students from non-Slavic countries (three genders – masculine, feminine and neutral) and declination (in their mother tongue there are no grammatical cases).

Serbian and Croatian students tend to form a past tense in the same way as is done in Serbian or Croatian language – an auxiliary verb in all grammatical persons, whereas in Slovak it is not used in the 3rd person: *on je čítal, to je bol problém, oni sú prišli.*

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Generally, most students have problems with the use of prepositional cases (but this is also observed in the Nitra region, e.g. „pri Tesco“, instead of “ k Tescu”), and do not understand nuances:

preposition v (place) / do (direction) – *v škole / do školy,*

v / na – *v škole, v Rusku, v Anglicku – na Slovensku, na univerzite*,

na + locative / na + acusative– *Študujem na univerzite. / Idem na kávu, na obed.*

pred + instrumental (place) / pred + accusative (direction) – *Som pred triedou. / Idem pred triedu.*

Next, is the correct/incorrect use of word order in sentences, the use of reflexive pronouns *sa, si* and their proper position in a sentence.

Due to the limited space it is not possible to list all mistakes, so we have mentioned those, which are, in our opinion, the most frequent and the most serious ones.

3.3 Research and international cooperation

The principal business of the Department of Foreign languages is to teach foreign languages. Teaching Slovak has always been of little importance at the university. We take for granted everybody can speak it well, for it is our mother tongue, so no special attention has ever been paid to it. Although teaching the Slovak language has not been included among scientific and research tasks, the most important activities in this field are the following:

2001 – 2003	Mgr. Viera Prídavková worked as a lecturer of the Slovak language at the Univesité Michel de Montaigne de Bordeaux in France
2000 – 2004	International scientific project Socrates, no.114034-CP-1-2004-ES-LINGUA-L2-CALL@C&S – Online Courseware for Learners of Czech and Slovak Project participants: doc. PhDr. Mária Užáková, CSc., PhDr. Jana Vrbová, PhD.
2005 – 2009	Mgr. Viera Prídavková worked as a lecturer of the Slovak language at the Université de Strasbourg vo Francúzsku.
2012	Project no. 12204-0298/NITRA02 under the Lifelong Learning program, Erasmus – Intensive Language Courses (EILC). Project participants: PhDr. Jana Vrbová, PhD., Mgr. Viera Prídavková, Mgr. Zuzana Rebičová, Mgr. Katarína Klimentová, Mgr. Andrea Holúbeková, PhD., Mgr. Mária Fördösová, PaedDr. Ľubomíra Moravcová, PhD.
2013	Project no. 13204-0369/NITRA02 under the Lifelong Learning program, Erasmus – Intensive Language Courses (EILC). Project participants: PhDr. Jana Vrbová, PhD., Mgr. Viera Prídavková, Mgr. Zuzana Rebičová, Mgr. Katarína Klimentová, Mgr. Andrea Holúbeková, PhD., Mgr. Mária Fördösová, PaedDr. Ľubomíra Moravcová, PhD.,

4. Conclusion

Courses of the Slovak language have never been of great importance at the Department of Foreign Languages at the Slovak University of Agriculture in Nitra. Teaching foreign languages has always reflected the need of the society and time. The arrival of foreign students at our university raised the need to teach the Slovak language starting with elementary Slovak, followed by more advanced levels of the language.

However, we can see that the existing structure of courses does not entirely fit changing political and economic situation. The formation of the independent Slovak Republic, the emphasis on the use of the state language, the requirements for the development of language culture at schools at all levels are the factors that suggest that there is a need for teaching Slovak students the Slovak language. Not only because the Slovak Constitution, article 6, paragraph 1 declares: „Slovak language is the state language of the territory of the Slovak Republic." but also because the Ministry of Culture continuously monitors the level of the language culture in all public institutions, sets tasks and checks compliance therewith. One possible response of the SUA in Nitra on these requirements could be an introduction of a new course, for example the Slovak Language for Academic Purposes. Its main aim might be the raising of linguistic culture of university students, the basics of rhetoric and stylistics, teaching them how to present and defend their opinions and instruct them in the area of social behaviour.

The report on the state of use of the state language of the Slovak Republic states the following: "… to introduce obligatory lectures of Slovak terminology concerning a particular field of study" (Report on the state of use of the state language of the Slovak Republic 2014, Education, Chapter 5 Final recommendations, paragraph 3). The Government resolution only "advises" rectors of universities to implement the relevant parts of the report, but it is a signal that it is necessary to make changes in this area.

In conclusion we can assume that in the future, the teaching of the Slovak language will not only depend on tutors and students studying at the university but mostly on the developmental concepts and strategies drawn by the leading managers of individual faculties at the university. They will affect future graduates, finances, courses and consequently an interest of students in taking up Slovak language courses.

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E-performance observation in teaching foreign languages

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Abstract
Teachers constantly try to increase students´ interest and their motivation to learn effectively to fulfil high requirements of national as well as international labour market. They look for innovative ways and possibilities of how to use the findings of technological progress in their teaching process to achieve educational goals. One of the latest methods is observation of students´ learning performance carried out in electronic courses (so called e-performance observation) which significantly differs from a traditional observation realized in face-to-face contact teaching. We applied it in teaching English to higher education students. The results obtained from conducted action research confirm our assumption that the use of e-performance observation provides teachers with a faster collecting and storing of relevant data and accurate recording of learning outcomes.

Key words: *action research, e-performance observation, teachers, the Internet*

JEL classification: *123*

1. Introduction

New technologies provide lots of opportunities and tools to improve teaching and learning processes. This enables people to become better prepared for current conditions of national as well as international labour market. To follow the way of modernization of education means to follow the trends and requirements of the 21st century. It is also a challenge for foreign language teachers to effectively use new technologies in their teaching process. In this respect the implementation of technologies concerns all levels and all forms of education (primary and secondary schools, as well as higher education institutions).

In this paper we focus on using an English e-course (presented via an online programme) and the method of e-performance observation.

2. Online programmes

"*More and more people are getting involved in computer assisted language learning research and the teachers are beginning to realize that computers are not just electronic gadgets but may well enhance the effectiveness of their teaching if properly used and programmed.*" (Malá, 2011, p. 113).

The importance of online education is that it can bring changes in educational practice and in educational institutions. Teachers experience these changes especially. A teacher has a certain number of fixed hours during the week when he/she has a classroom setting. At universities they have to have "office hours" during which they are available to students. The learning network environment, on the other hand, is available to students and teachers 24 hours a day. Students expect regular and ongoing interaction with their teacher. Networking technology not only affects the communication between students and their teacher but it also expands opportunities for students to communicate among themselves. It allows the students to collaborate with one another as a part of the learning process. In a classroom students can be quiet, but in a learning network they are forced into participation. The attributes of anytime and

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anyplace communication make group of interaction and collaboration in online media distinctive. Students can interact with one another in seminars, group projects or role plays, take part in e-lectures or contact their teachers and tutors online. They can communicate with one another at different time and from different locations. (Harrison & Stephen, 1996).

As Clark and Kwinn (2007) claim, online programmes offer powerful instructional environments while saving travel time and costs associated with traditional face-to-face classroom training. Effective use of visualization, audio- and interactive features are the main parts to effective instruction in an online programme. The key to success requires more than mastering the mechanics of these features. The potential of the online programme can fully be exploited only by correct using of visuals, audio-visuals and interactions. The benefits of online programmes include reduced travel time and costs, less time away from the job, faster deployment of time-urgent knowledge and skills, and higher completion rates compared to self-study e-learning. From a learning perspective, there are opportunities for immediate interaction and feedback from the teacher.

A tutor is the person involved in online teaching. It is the person who oversees the successful mastery of the course and appropriate support in the study of students. He is ready to give some advice to students, to manage student sessions – tutorials, or discussions on student web, as well as to correct written tests and provide a feedback to students. The role of tutors differs from the traditional form of education mainly in the fact that their job is not to give lectures only, but to support their students in their learning process by using various modern ways and methods and available electronic means. (Zlámalová, 2004).

Zikuška and Škyřík (2008) define the following pedagogical competences of the tutor:

a) *didactic competences* – oriented in teaching and learning styles. The tutors evaluate independent students´ work, give them adequate feedback, motivate and encourage them in their further study,
b) *communicative competences* – focused on the discussion and its appropriate evaluation. The tutors ask questions that create a potential source of learning. To be able to communicate not only in the written way, but also in other forms of communication is most important here.
c) *organizational competences* – familiarizing students with study requirements. The tutors introduce the methods and ways of evaluation in a suitable and understandable form,
d) *technical competences* – means mastering not only work in the learning management system environment, but the ability to provide students with sufficient technical support.

2.1. The online programme MyLanguageLeaderLab

MyLanguageLeaderLab is an online Learning Management System (LMS) programme. It provides interactive exercises with automatic marking and offering immediate feedback to students thus saving teacher´s time. The scores are automatically transferred to a gradebook. It avoids the necessity of spending valuable class time going through homework at the beginning of lessons. Students have greater motivation to complete homework assignments if they are available online. It is easy not only to monitor students´ activity and progress but also to quickly identify and remedy any weaknesses or strengths of individuals or the whole class. Communication tools allow students and teachers to interact with each other and extend learning opportunities beyond the classroom. (Pearson Education Limited, 2009).

MyLanguageLeaderLab was designed to provide an easy-to-use entry to online learning with reliable materials for teachers. The system allows to set assignments via the Internet and students can access it from any computer. The LMS uses a tested content of the Language

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Leader Language series in a more interactive way, with some added extras, to take full advantage of the exciting opportunities presented by online learning. The online programme saves time, improves results and expands English language learning.
(Pearson Education Limited, 2009).

3. E-performance observation

The English e-course was implemented through the online programme MyLanguageLeaderLab at the Slovak University of Agriculture in Nitra. The action research was carried out with a group of fourteen second-year students of the study programme Business Management at the Faculty of Economics and Management who attended English classes.

The action research is a disciplined process of inquiry conducted by and for those taking the action. The primary reason for engaging in action research is to assist the „actor" in improving and/or refining his/her actions. It is always relevant to the participants. The relevance is guaranteed because the focus of each research project is determined by the researchers who are also primary consumers of the findings. Even more important is the fact that it helps educators be more effective at what they care most about – their teaching and the development of students´ knowledge. (Sagor, 2000).

We observed students´ performance in the electronic course and that is why we call it e-performance observation. We watched those indicators which appear during the study in the online programme *MyLanguageLeaderLab* that was presented within an English e-course and, at the same time, we recorded the findings with a perfect accuracy. This kind of observation differs from a traditional (live) gathering data in its naturally occurring situations. No mediated methods or second-hand information need to be used in the e-observation. Most of researches conducted in the area of e-learning or blended learning were mainly focused on learners and their behaviour and activities during working in the electronic environment. In the last years, however, there started to be published papers taking into account "the other side" of the problem concentrating on the indicators, or properties which electronic programmes contain and provide. To determine these indicators and to specify their functions in teaching English we decided to use e-performance observation in our research.

The observation performed in our research considered five dimensions suggested by Flick (in Cohen, Manion and Morrison, 2007, p. 398):

- structured, systematic and quantitative observation (generating numerical data, comparing frequencies)
- non-participant observation
- covert indirect observation (the presence of the observer was unknown, the data were recorded via computer system)
- observation in unnatural, artificial setting (at the computer out of the classroom)
- observation of others (not a self-observation).

To gather the data observed of the observed online programme indicators we used a sign system to be able to subsequently compare the results of our e-observation. A structured observation sheet was created for this purpose. Though the preparation of such an observation sheet takes much time, the analysis of the data is rather rapid. As the observer is not under a time pressure, he/she can complete the observation sheet precisely thus achieving the reliability of results.

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The indicators of the online programme which were noted down by the e-performance observation included:

- the day when the respondent started to use the online programme
- the hour when the respondent started to use the online programme
- the period of time the respondent spent working in the online programme.

We followed several stages in our e-performance observation:

- choosing the participants, i.e. the respondents of the action research group
- setting the activities to be observed, i.e. the indicators of the online programme
- preparing a structured and focused observation sheet
- providing to each entry (each indicator) its symbol.

For taking notes in our observation sheet we decided to use these abbreviations as symbols for each entry:

The abbreviation "S" means student; in this case it was the respondent in the action research group. As there were fourteen respondents in the group, they were labeled from S1 to S14 in our observation sheets.

The abbreviation "D" means day; the following abbreviations for each day of a week were stated: Su = Sunday, Mo = Monday, Tu = Tuesday, We = Wednesday, Th = Thursday, Fr = Friday, Sa = Saturday.

Within the "hour" the exact time differentiating morning (= a.m.) and afternoon or evening (= p.m.) was registered in the observation sheets.

For the purpose of our research, we intentionally chose six weeks in equal time intervals to be observed, namely the 4th week, the 8th week, and the 12th week of both the winter and summer terms. We did not follow any predetermined plan, we used the possibilities offered by the online programme *MyLanguageLeaderLab,* and we observed the weeks approximately representing the beginning, the middle and the end of the term which obviously includes thirteen weeks in total. From the e-performance observation we found out when the respondents prepared their assignments and did their homework, whether it was immediately in the first day after the contact lessons or just before the classes.

The online programme *MyLanguageLeaderLab* provides a number of variable exercises, from the simple to the complex ones, such as fill-in exercises, matching, multiple choices, scrambled letters, dropdown exercises, true-false tasks and gap-fill tasks with drag-drop (students drag the correct words or phrases into empty spaces).

As an example we present a possible record following the e-observation. For the purpose of the description, we chose S5 who was the respondent in the group of action research. In Table 1 we give the data concerning completing five exercises by S5 in the 8th week of the winter term, where "F" stands for the frequency (the number of respondents´ attempts, i.e. how often the student entered the exercise to complete the task successfully). "Time" means the period in minutes during which the respondent worked with the given exercise in the online programme.

Table 1: E-observation of S5 in the 8th week (winter term)

	Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5

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Student 5 8th week	F	Time	F	Time	F	Time	F	Time	F	Time
	1	2	2	6	1	2	2	5	1	2

Source: own processing

By this particular example of one respondent´s activities in the online programme *MyLanguageLeaderLab* we showed the importance and effective usability of indicators which function within this online programme. We also wanted to bring a closer look at the English language study in e-learning environment with the possibilities it offers.

4. Conclusion

E-performance observation was conducted to give an image of the respondents´ participation in the e-course, to set the intervals and time periods during which they completed their homework. The purpose of the e-performance observation was not to give the statistical data of the frequency of attempts of the respondents, the time spent working in the online programme, nor to show some correlation between the number of the attempts and the success in the tests achievements of the respondents because it would require a much broader research. The aim was to present how the e-course elements may be useful for the teacher in order to get familiar with the students´ activities while performing their tasks and homework exercises electronically. By this way, the teacher can get useful information about a student separately, or about the whole group of students, about their approach to study, learning intervals, and other relevant data. The main indicators which are extremely important in this respect, and can be of great help for the teacher in teaching English (resp. any other subject performed in electronic learning environment) are: indicator of the day, indicator of the hour, indicator of the time spent and indicator of frequency. The function of the indicators is to give the teacher a general overview about the students´ activities performed within the e-course and their increasing interest in the field studied.

By a regular e-performance observation (about which the observed students do not know, so they act and do their homework as they usually do), the teacher may modify his/her own teaching, follow the students´ learning progress and even predict their improvement and success in learning. By having such pieces of information, the teacher can also influence the students´ learning achievements by including those language areas which seem to be difficult for students.

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Selected problems of sugar beet growing in Slovakia

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Abstract
Sugar beet is a technical crop of the temperate zone which is predominantly used for the sugar production in our country. In industry it is also utilized for the production of bioethanol and molasses. The use of this crop is significant in pharmacy and forage growing, too. At our territory sugar beet rangs among the cultural crops with the long-time growing tradition and the subsequent processing in the sugar industry. Since the accession of the Slovak Republic into the EU the sugar-making industry in Slovakia has been influenced significantly by the regulations of the Common Organization of Sugar Market which regulates the quantity of produced sugar by the system of the assigned domestic quotas. Recently a slight increase of sugar beet harvesting area as well as sugar beet production has been recorded, however, sugar production has fluctuated. in the sugarbeet season 2013/2014. 190 growers grew sugar beet with the average saccharinity of 16.80 %. Sugar beet was processed in two sugar refineries - Považský cukor, Plc. in Trenčianska Teplá and Slovenské cukrovary, Ltd. in Sereď with the processing capacity of more than 10, 000 tonnes of sugar beet per day. Both sugar refineries produced totally 172, 568 tonnes of sugar and they exceeded the production quota by 60, 248.5 tonnes (53.6 %). Our paper deals with the evaluation of the selected economic and marketing indicators of sugar beet growing in 2008 – 2014.

Key Words: *Costs, Harvesting Area, Production, Producer Price, Rentability, Sugar Beet.*

JEL Classification: *Q 11, Q12, Q13*

1. Introducion

The history of the sugar production goes back to the beginning of our era. At that time sugar was produced from the sugar cane grown in the rain primaeval forests in New Guinea. However, India was the important grower of this cultural grass. The cultivation of sugar cane was expanded from this country into the warm areas of the whole world. Nowadays, sugar cane is grown in approximately 80 countries of the world and they produce from it almost 80% of the world production of sugar (115 mil. tonnes per year). The raw material for the rest of the world sugar production is sugar beet. The beginning of the sugar beet cultivation in Europe is related to the early 19 century. At that time, in particular in 1802, the first sugar refinery in the world was founded in Wiňsk in the Lower Silesia. Sugar beet as a cultural crop is the only material for the sugar production in our country. At our territory the sugar beet cultivation started in the northern parts of Slovakia at the beginning of 19 century. In the middle of 19 century the cultivation was moved to the territory of the south-west of Slovakia where sugar beet is grown until now. The first sugar refinery at the territory of Slovakia in the Austro-Hungarian monarchy was based by Mikuláš Lačný in Veľké Úľany in 1828. Since then 34 sugar refineries have been operated at our territory. After 1990 sugar beet growing has been declined and the reforms in sugar industry resulted in termination of eight Slovak sugar refineries.

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Nowadays, the regulations of the Common Organization of Sugar Market have the significant impact on the sugar production in Slovakia and other EU countries. This organization has regulated the sugar regime in the EU countries without any considerable changes since 1968. The termination of the common organization of the sugar market is planned in 2017. One of the principal tools of the Common Organization of Sugar Market are the production quotas for the sugar production and they influence directly also the sugar beet production. In Slovakia sugar beet ranks among the crops with the highest amount of the direct payments per the unit of area. In 2014 this payment achieved 803.53 €.ha^{-1}, out of it the special payment for sugar was 597.96 €.ha^{-1} and the flat payment per area 205.57 €.ha^{-1}. In the economic year 2013/2014 there 190 growers grew sugar beet at the area of 22, 212 hectares. They produced totally 1,148,000 tonnes of sugar beet of the average saccharinity 16.80 %.

2. Data and methods

The objective of the paper is the development evaluation of harvesting areas, yields, saccharinity, costs and production of sugar beet. Furthermore, we analyzed the subsidies provided to sugar beet growers in particular years, exercise prices, earnings and revenues. The economic results and the cost effectiveness and rentability with subsidies and without them was calculated by the given indexes.

We concentrated our attention on the selected aggregate of companies in Slovakia, monitored and registered by the database bank of the National Agricultural and Food Centre and the Research Institute of Agricultural and Food Economics in Bratislava during the period of 2008 – 2014. In the paper the methods of analysis, synthesis, comparison and simple mathematical and statistical methods have been used.

The relevant data have been acquired from the Statistical Office of SR, from the Situation and Prospective Report of the Research Institute of Agricultural and Food Econonics, the National Agricultural and Food Centre of the Ministry of Agriculture and Rural Development of SR and from the publications Expensiveness of Agricultural Products in SR 2008 – 2014.

3. Results and discussion

Sugar beet growing in Slovakia has had more than 200-year tradition in connection with the sugar-making industry. During the recent 30 years the lowest harvest areas of sugar beet (11, 118 hectares) were recorded in 2008. In the 80-th of the last century the harvest areas were at the level more than 50,000 hectares. Since then the harvest areas had been decreased continuously and they fell to the lowest level in 2008. From that year we have monitored the yearly growth of the harvest areas with the highest level in 2014 (22, 212 hectares). In comparison with 2008 – 2014 this growth is twofold. The development of the harvest areas of sugar beet in 2008 – 2014 is given in the Table 1.

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Tab.1 Development of harvest areas of sugar beet

Indicator	MJ	2008	2009	2010	2011	2012	2013	2014	Index 14/09
Harvest areas	ha	11.118	15. 952	17.932	18. 096	19.741	20.333	22.212	2.00

Source: Statistical Office and own calculations

In the Table 2 there the development of yields per hectare, saccharinity and sugar beet production in Slovakia in 2008 – 2014 is recorded. The yields per hectare and saccharinity have the significant impact on the economic effectiveness of sugar beet growing. The Slovak growers achieved the highest average yields per hectare of sugar beet in 2014 (69.79 $t.ha^{-1}$), the lowest ones in 2012 (45.31 $t.ha^{-1}$). Sugar beet of the standard quality must have the saccharinity at the level of 16%. The saccharinity is the essential qualitative sugar beet requirement and it is associated with the minimal price of the quota sugar beet (26.29 $€.t^{-1}$). The average saccharinity lower than 16 % was recorded in 2010 and 2014. The production depends in the harvest areas and yields per hectare. The highest production (1, 550,200 t), was registered in 2014. In 2008 – 2014 we recorded the growth of sugar beet production by 872,000 tonnes.

Tab. 2 Development of yields, saccharinity and sugar beet production

Indicator	MJ	2008	2009	2010	2011	2012	2013	2014	Index 14/09
Yield	$t.ha^{-1}$	61.07	56.00	54.52	64.14	45.31	56.29	69.79	1.14
Saccharinity	%	16.21	16.60	15.44	18.03	16.50	16.80	15.40	0.95
Production	thousands of tonnes	678.2	898.8	978.7	1 160.7	894.5	1 144.6	1 550.2	2.29

Source: Research Institute of Agricultural and Food Economics and own calculations

Apart from the saccharinity and yields per hectare, which are given in the Table 2, the costs, subsidies and exercise prices have the significant impact on the effectiveness of sugar beet growing. The development of the costs, exercise prices, subsidies, revenues, earnings and the economic results without subsidies and with subsidies achieved in sugar beet growing in 2008 – 2014 are given in the Table 3. The costs per hectare proved to be rather balanced values and they are falling slightly per tonne. Similarly, the level of the exercise price is stable. The subsidies provided to the sugar beet growers are the sum of the flat payment per area and the special payment for sugar. The highest subventions (803,35 $€.ha^{-1}$) were recorded in 2014 and the lowest ones (416,33 $€.ha^{-1}$) in 2010. Totally, within the evaluated period they were increased by 14%. In the revenue index the subsidies are not included and the earning are calculated as the revenues and subsidies. The highest revenues and earnings (2 587.1 $€.ha^{-1}$ or 3 390.5 $€.ha^{-1}$) were recorded in 2014, the lowest ones (1 662.9 $€.ha^{-1}$) in 2012, the revenues in 2010 achieved 2 399,2 $€.ha^{-1}$. We have calculated the economic result per hectare with subsidies and without them by these indicators. The average economic result was positive in all the studied years, apart from the exception of 2012. In that year the sugar beet growing was unprofitable without subsidies (-381,8 $€.ha^{-1}$).

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Tab. 3 Development of costs, exercise prices and subsidies of sugar beet

Indicator	MJ	2008	2009	2010	2011	2012	2013	2014	Index 14/09
Costs	€.ha^{-1}	1 948.8	1 833.5	1 908.9	2 024.8	2 044.7	1 948.7	1 942.4	1.00
Costs	€.t^{-1}	29.3	29.6	29.6	29.6	43.6	33.2	25.3	0.86
EP	€.t^{-1}	37.61	41.95	36.37	36.13	36.70	40.09	37.07	0.99
Subsidies	€.ha^{-1}	703.73	700.29	416.33	752.83	771.42	782.95	803.35	1.14
Earnings	€.ha^{-1}	2 296.8	2 349.2	1 982.9	2 317.4	1 662.9	2 256.7	2 587.1	1.13
Revenues	€.ha^{-1}	3 000.6	3 049.5	2 399.2	3 070.2	2 434.3	3 039.6	3 390.5	1.13
VH^1	€.ha^{-1}	348.0	515.7	74.0	292.6	-381.8	308.0	644.7	1.85
VH^2	€.ha^{-1}	1 051.8	1 216.0	490.3	1 045.4	389.6	1 090.9	1 448.1	1.38

Source: Statistical Office, Research Institute of Agricultural and Food Economics and own calculations

Note: 1 – without subsidies, 2 – with subsidies

Tab.4 Development of rentability and effectiveness of sugar beet production

Indicator	2008	2009	2010	2011	2012	2013	2014
Cost effectiveness^1	1.18	1.28	1.04	1.14	0.81	1.16	1.33
Cost rentability^1	0.18	0.28	0.04	0.14	-0.19	0.16	0.33
Cost effectiveness^2	1.54	1.66	1.26	1.52	1.19	1.56	1.75
Cost rentability^2	0.54	0.66	0.26	0.52	0.19	0.56	0.75

Source: own calculations by using data from Table 3

Note: 1 – without subsidies, 2 – with subsidies

In the Table 4 the development of rentability and effectiveness of sugar beet production costs are given. As it is evident from the table, we can rank sugar beet among the crops which are grown with a high rate of rentability. Sugar beet cultivation in Slovakia was profitable in 2008 – 2014. The highest revenues per 1 € investment (without subsidies) were achieved in 2014 (1.33 €) and in 2009 (1.28 €). We registred the negative rentability only in 2012 (-0.19 €). Sugar beet growing with subsidies is highly profitable. The highest rentability was recorded in 2014 (0.75) and in 2009 (0.66).

In the Figure 1 the development of refined sugar consumption in kilograms per capita and one year is recorded, including the products containing sugar, in the period of 2008 – 2014. During the studied period the sugar consumption per capita fell by 4.5 kg. year^{-1} (13 %). The highest consumption was monitored in 2008 (34.5 kg.year^{-1}) and the lowest one in 2012 (29.5 kg.year^{-1}). The recommended consumption of refined sugar per capita, including sugar products, in accordance with the basic model of the recommended doses of food is at the level of 30.9 kg.year^{-1}. A higher consumption was registered in 2008 – 2011 and 2013. In 2012 and 2014 the real sugar consumption was lower than the recommended one (29.5 kg.year^{-1}, resp. 30.0 kg.year^{-1}).

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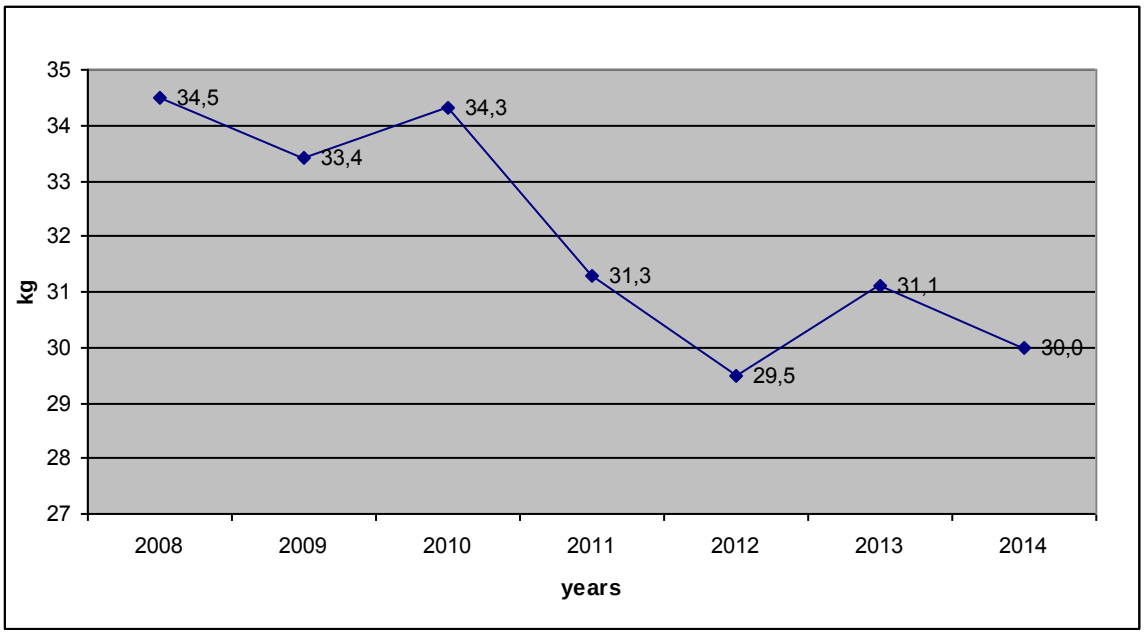
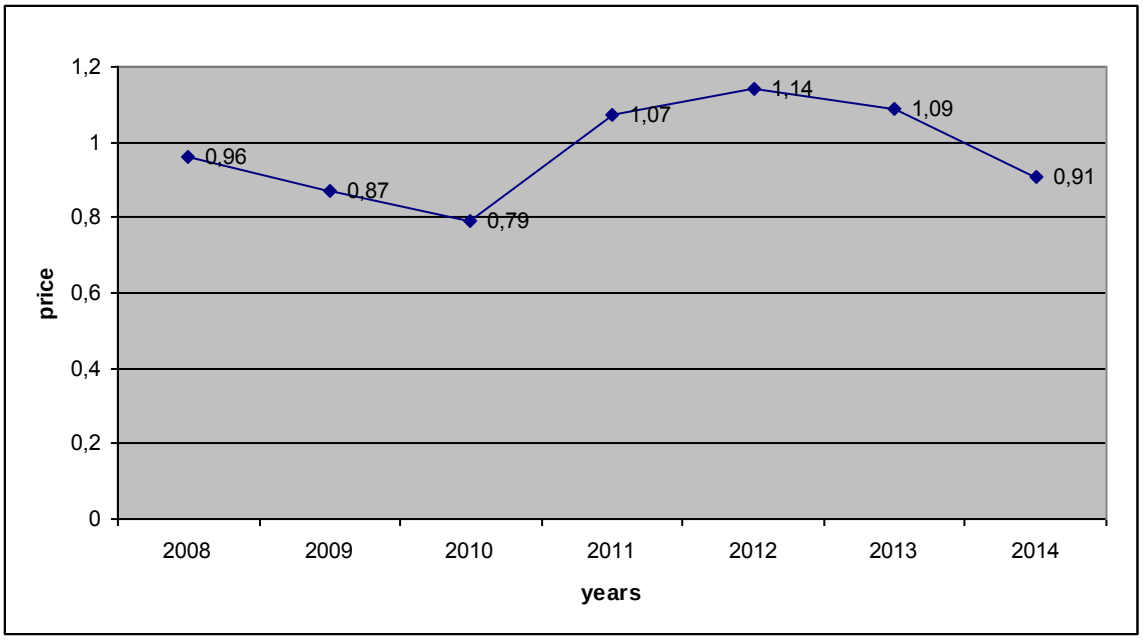
Figure 1: Development of refined sugar consumption per capita (kg.year^{-1})



Source: Authors according to the data of SO SR

The development of the annual consumer prices of the granulated sugar in 2008 – 2014 is given in the Figure 2. In 2008 the average price was 0.96 €.kg^{-1}. From 2008 to 2010 the consumer prices of sugar were decreased (decline by 0.17 €.kg^{-1}) and after 2010, i. e. in 2011 and 2012 the prices reached the level of 1.14 €.kg^{-1}. From 2012 we have monitored again the decline of the consumer prices of sugar. In 2013 year-on-year decrease was achieved by 0.05 €.kg^{-1}. In 2013 and 2014 this decline was represented by 0.18 €.kg^{-1}. In this year the average consumer price of sugar is 0.91 €.kg^{-1}. During the monitored period 2008 - 2014 the total decrease was 0.05 €.kg^{-1} (5,2 %).

Figure 2: Development of average consumer prices of granulated sugar (€.kg^{-1})



Source: Authors according to the data of SO SR

4. Conclusion

Sugar beet is a traditional crop cultivated in Slovakia. In our country it is the only raw material suitable for sugar production. In the EU countries sugar beet growing is influenced by the Common Organization of Sugar Market, which specifies the production quota for sugar and isoglucose to the particular countries in every economic year. For the economic year 2013/2014 the sugar quota for the Slovak Republic was at the level of 112, 319.5 tonnes. The Agricultural Paying Agency divided the quota for the company Považský cukor, Plc. – 68, 478.5 tonnes and for the company Slovenské cukrovary, Ltd. - 43 841,0 tonnes. Both sugar refineries produced totally 172, 568.0 tonne of sugar, i.e. they exceeded the quota by 60, 248.5 tonnes.

In our paper we are evaluating the selected economic and marketing indicators of sugar beet growing and sugar production in 2008 – 2014. In that period the harvesting areas of sugar beet were doubled and in 2014 they achieved the level of 22, 212 ha. The average yields per hectare grew by 14%. The growth of harvesting areas and yields resulted in the sugar production growth by 872,000 tonnes, which means the production increase by 229%. The required saccharinity 16% and more was not achieved in 2010 and 2014. Sugar beet seems to be the crop of high rate of rentability. Apart from the costs and exercise prices the economy of sugar beet growing is influenced significantly by the subsidies provided to growers. Besides the unified payment per area, they are also given the special payment for sugar. Totally these two payments meant the subvention of 803.35 €.ha^{-1} in 2014. This is also the reason why sugar beet growing is attractive economically and profitable in all the evaluated years with the highest profit achieved in 2014 (1 448.1 €.ha^{-1}).

In conclusion, the development of the refined sugar consumption per capita is given in a graph, including the sugar products, and also the development of the granulated sugar prices. Both graphs show the decreasing tendency. In 2008 – 2014 the refined sugar consumption fall by 13% and the consumer prices of granulated sugar were recorded as the decline by 5.2%. Based on the evaluated aspects and results we can state that sugar beet growing in Slovakia is an important activity and for the growers it is economically interesting sector of the plant production with the high rentability.

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Partnership experience between Russian and European universities in agrarian profile educational programs quality providing

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Abstract
Agrarian profile educational programs quality providing in Russian and European universities is crucial for the development of agricultural production. They must meet the requirements of employers. The international project "Development of professional public accreditation system of agrarian (agricultural) profile educational programs in the Russian Federation» ("Tempus-PACAgro") brought together representatives of Russian and European universities with the aim to reform the system of quality assurance. The project involves representatives of employers. The participation of representatives of Russian universities in the Erasmus Mundus program provides additional opportunities to study the experience of European universities. An important task for the Russian and European universities is to develop new opportunities for cooperation in order to guarantee agrarian profile educational programs quality providing. Primarily it is participation in the double diploma degree programs that promote mutual understanding and trust between universities-partners, laying the foundations for long-term cooperation, leading to the search for tools to improve the quality of education.

Key words: *agricultural university education, quality providing*

JEL Classification: *I2, I20, I21, I23*

1. Introduction

The most important task is to improve the quality of agrarian profile educational programs in Russian and European universities. They are crucial for the development and improvement of agricultural production in modern conditions. University graduates who came to the production, must be well prepared and adapted to work in constantly changing conditions in accordance with the requirements of innovative environment development, they are required to solve effectively the challenges facing the company and the industry.

Employers make high demand for graduates, which suggests the following qualifications:
- Professional knowledge and practical skills for the professional activity of small, medium-sized and large companies;
- Long-term sustainable activities and initiatives (including overtime);
- Identifying and solving problems flexibility and stability;
- Satisfaction from activity;
- Lifelong learning;
- The ability of social interaction;
- Ability to communicate in a foreign language;
- Other competence arising in the corporate culture and business. [1]

2. Data and Methods

The international project "Development of professional public accreditation system of agrarian (agricultural) profile educational programs in the Russian Federation» ("Tempus-PACAgro") brought together representatives of Russian and European universities with the aim to reform the system of quality assurance. Participants of the project are higher educational institutions from

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different regions of Russia (Moscow, St. Petersburg, Tatarstan, Kabardino-Balkar Republic, the Republic of Mari El). Foreign partners of the project are the Slovak University of Agriculture in Nitra (Nitra, Slovakia), Aleksandras Stulginskis University (Kaunas, Lithuania), Estonian University of Life Sciences (Tartu, Estonia), of Lleida (Lleida, Spain), Catalan University Assurance Agency (Barcelona, Spain).

The project involved "Agribusiness Association of educational institutions and fisheries." The partners of the project "Tempus - PACAgro» are representatives of employers: Limited company "Rusmarketkonsalting" (Saint-Petersburg, Russia), Federal State Budgetary Scientific Establishment "Institute of agroengineering and environmental problems of agricultural production" (Saint-Petersburg, Russia), the Agricultural Industrial Cooperative "Pedigree Plant on black and white cattle breeding 'Detskoselsky" (Saint-Petersburg, Russia).

The participation of representatives of Russian universities in the Erasmus Mundus program provides additional opportunities to study the experience of European universities.

An important task for the Russian and European universities is to develop new opportunities for cooperation in order to guarantee agrarian profile educational programs quality providing. Primarily it is participation in the double diploma degree programs that promote mutual understanding and trust between universities-partners, laying the foundations for long-term cooperation, leading to the search for tools to improve the quality of education.

3. Results and Discussion

Russian participants of the TEMPUS project "PACAgro" studied the experience of European higher education institutions to ensure quality assurance of agricultural profile educational programs. In accordance with European standards, educational institutions should have their own policies and procedures for quality assurance, as well as the standards for ongoing programs and assigning qualifications. Students and other interested parties should also be involved in this process. Standards and criteria for assessing the quality of educational programs used by accreditation agency AQU Catalunya, are important for the Russian project partners.

At the Faculty of Economics and Management, Slovak University of Agriculture in Nitra (SUA) are working the faculty councils on quality. The Faculty offers undergraduate and post-graduate students the programs in the Slovak and English languages. Preparation of agricultural profile educational programs in English is an urgent task for Russian universities. It should be noted that the Slovak Agricultural University is connected to the net "Trends of Graduaten Barometer", consisting of more than 1,000 European universities through which it monitors issues of education and career. On the website of the network, students can comment on these questions within the framework of the on-line survey. It is essential for Russian and European partners of the project to study the experience of the Faculty of Economics and Management FEM (Nitra) in the development and successful implementation of the program of double diplomas.

Studying the experience of Alexander Stulginskis University (Lithuania) showed that the organizational document of quality assurance is an approved by order of the rector of the University, "Quality Assurance Manual". The university independently decides on the need for the development and registration of new educational programs. The main criteria for the decision are: the need for specialists on the labor market; the attractiveness of the educational program for applicants; University scientific expertise in the new program. New educational program could be initiated not only by the University management staff and faculties, but also by separate group of scientists, and even employers, the social partners. Feedback in the process of the quality education improvement is ensured by the implementation of opinion polls among all participants in the learning process.

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The Estonian University of Life Sciences has developed and implemented the survey system that includes all the target groups. Estonian Employers involved in all quality assurance processes (internal and external), as well as part of the international group of experts [2].

Conducted within the framework, survey of Russian employers showed their interest in quality of the graduates. 81% of employers would like to meet the students in advance to find out their level of professional and theoretical knowledge and practical skills, to get to know them as persons, to improve their skills in principle and in relation to this production (if the graduate will apply for work) [3].

When clarifying what kind of knowledge and skills are lacked for the engineer of agricultural mechanization, respondents noted: lack of knowledge in manufacturing operation and equipment in agro-industrial complex, poor knowledge of a foreign language. 57% of employers believe that the level of theoretical and practical training of graduates over the past 5-10 years has improved, 27% - consider that there is no change, and 15.4% - that it became worse. According to the survey 73% of respondents are familiar with the employers' training programs in agricultural universities.

Concerning the desire of employers to spend some time to participate in the procedures of professional public accreditation of higher education programs only 64% of respondents agreed to participate in the procedures of professional public accreditation of higher education programs, among them (respondents could give more than one answer):

- 41% are ready to participate in the survey to assess the educational program;
- 21% are ready to participate in the evaluation of educational programs;
- 12% are ready to participate in the external examination.

Participation of Russian universities representatives in the Erasmus Mundus program provides additional opportunities to study the European experience to guarantee the quality of educational programs. University of Natural Resources and Applied Life Sciences BOKU (Vienna, Austria) in 2015 marked the 10th anniversary of «ALUMNI» foundation - the Union of graduates. The Central Union - Dachverband - includes 3,000 members. It is headed by the Rector Professor Martin H. Gerzabek, a graduate of the BOKU. The main objectives of the Union:

- Assistance to graduates in job placement, training and contact establishment between professionals;
- BOKU journal publication and management of graduates database;
- Cooperation with other professional associations of graduates.

Totally Central Union Alumni together with other professional associations includes 5800 graduates.

Besides, there is a union of BOKU graduates, www.agrarabsolventen.at, which recently celebrated its 100th anniversary (BOKU marked140-th anniversary in 2012) and sees its role in support of BOKU Rector, training organization, experience exchange between generations and assistance in graduates' employment. This Union is headed by the head of the education department of the Ministry of Agriculture and Forestry, Water Resources and Environment. BOKU graduates are also integrated in the following Unions:

- The Austrian Union of Forestry (Österreichischer ForstakademikerInnen Verband) www.forstalumni.at
- Union of wood industry workers (Verband Holzwirte Österreichs (VHÖ) www.boku.ac.at/vhoe .One of it's tasks is to make an assistance in the preparation of bachelors and masters in BOKU.

- Alumni Union in the field of the natural sciences and water (Verband der AbsolventInnen der Studien für Kulturtechnik und Wasserwirtschaft www.ktverband.at
- Association of Austrian technologies in the field of food and biotechnology products (Verein Österreichischer Lebensmittel- und Biotechnologen (VÖLB) www.voelb.at
- Austrian Society for Landscape Planning and Landscape Architecture (Österreichische

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Gesellschaft für Landschaftsplanung und Landschaftsarchitektur (ÖGLA) www.oegla.at - Alumni Association in the field of environmental management and biological resources (Verein der Absolventinnen und Absolventen der Studien für Umwelt- und Bioressourcenmanagement (UBRM-Alumni) www.ubrm-alumni.boku.ac.at

At the Institute of Landtechnik BOKU for many years lectures on safety in agriculture and forestry are read by specialists of the safety and health department of the Social Security Service of Austrian peasants. Students gain knowledge in the field of occupational safety and health in agriculture and forestry, including relevant information about companies and the latest technical operations in the field of occupational safety and health. And they are familiar with the potential job place.

Professional contacts of BOKU faculty with various agricultural enterprises and organizations are developed through various collective activities. One of the examples of this is the award ceremony for the best agricultural enterprises in Austria in various categories, carried out by newspaper Bauern Zeitung («Peasant newspaper"), 25.11.2015, within the framework of the exhibition of agricultural machinery Austro Agrar. A special prize for the safety of agricultural machinery was received by Ballenboy firm, which developed a conveyor http://www.bauernzeitung.at/?id=2500,1083622. This event was preceded by a long work on the announcement for the best safe machinery competition, establishment of an independent expert jury, comprising representatives of the Austrian Council for Agricultural Technology, BOKU University experts, the Social Security Service of the peasants. BOKU students and undergraduates were invited to the award ceremony.

Scientists of Bodenkultur University take part in the preparation of the annual Oekosoziales Forum Oesterreich, which is called think tank - the brain center and Denkfabrik - factory of ideas. The forum is held within a week on different thematic platforms of Vienna and other cities in Austria. Topics of 2016 are: farming, poultry farming, vegetable growing and gardening, the policy in the field of forestry, wine-making, the development of agricultural production in mountainous areas, pig-breeding, meadows and cattle keeping, communication. The first day of the forum "Winter Tagung-2016", which brought together representatives of all lands of Austria, farms, agribusiness structures, higher education institutions, as well as public institutions and organizations, focused it's work on agricultural policy of the European Union and Austria, and summed up the past year results and concentrated on the strategic challenges for the future. Presentations by the World Trade Organization and the European Parliament representatives, the Minister of Agriculture and Forestry of Austria aroused active discussion, which was attended by President of Oekosoziales Forum Europa, a professor of Humboldt-Universitat from Berlin, the representative of REWE International AG, the president of the Austrian association of hotels owners and managers, the president of the Chamber of Agriculture in Austria [4].

4. Conclusion

Carried out in the framework of the project "Tempus" research and study of the experience of the University of Natural Resources and Applied Life Sciences (BOKU, Vienna, Austria) in the framework of Erasmus Mundus program showed the main directions of improving the quality of educational programs to improve the training and skills of graduates of Russian universities:
1) organization of joint seminars, debates of the academic community and employers in order to clarify the relevance of existing programs and the development of new needs.
2) Inclusion of the employer's representatives in working groups (committees) responsible for the improvement of existing programs and development of new ones.
3) Inclusion of employers representatives in working groups to carry out an internal evaluation of programs quality.

4) Increased representation of employers at faculty and university management Board.
5) Creation of "Alumni" (Alumni) in agricultural universities in Russia [5].
6) The participation of teachers in activities carried out by the Ministry of Agriculture with the participation of employers, representatives of business and mass media.
7) Participation in programs of double diplomas that promote mutual understanding and trust between partner universities, laying the foundations for long-term cooperation, leading to the search for tools to improve the quality of education. The real opportunity for the development of double degree program can provide the participation of Russian universities in the Erasmus Plus Program [6, 7].

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Roles of business ethics in new global economic environment

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Abstract
Business Ethics is one of applied ethics and its contemporary task is to morally regulate activities of economic subjects in a new global economic and social environments. Business activities within this environment are connected with many immoral practices leading towards global inequalities, global social thunders, and conflicts or deepening some of the global problems. The business ethics focuses on the fact that in attempt to succeed in the market and global competition, economic subjects forget about the principal role of economics which is to satisfy the needs of citizens in the world and take part in development and improvement the quality of their lives. It clarifies the need to examine business activities from the point of view of ethics and take into consideration also the global ethos in a new global economic environment. Furthermore, it proves the need to morally regulate business activities so that business subjects realized their activities in a global environment responsibly towards all members of business as well as towards the nature. Last but not least, the role of the business ethics is to warn contemporary and future entrepreneurs so that moral behaviour of entrepreneurial subjects represents one of instruments of increasing competitiveness.

Key words: *Business Ethics, new global economic and social environments, business activities, immoral practices, morally regulate*

JEL Classification: *A22, F01, I25*

1 Introduction

A new global environment, created by the powers of globalization provides entrepreneurial subjects with new possibilities for forcing their economic interests in a global scale, for increasing business, growing integration of international market, and thus also satisfying human needs. National economics open to the international business, global competition comes forward, entrepreneurial investment is widened, international work division grows, etc. Globalization creates a situation of freedom, better condition for free activities in a globalizing world economy, enabling for entrepreneurial subjects to reach economic growth and furthermore also the growth of life quality. At the same time, it brings the whole scale of phenomena reasonably complicating a positive development of humankind on the planet as some uneqalities, global problems, risks or threats do not arise, they deepen or widen thanks to irresponsible, unjustice or unfair entrepreneurship in a new global environment. In an attempt to calm them down, a process of economic globalization should come through not only legal but also moral regulation. As it is stated: "last but not least, also a global market needs its ethos" (Küng, 2000, p.42). A global ethos should be binding equally for every economic and entrepreneurial subjects engaged due to the fact that except of some other forms of regulation, moral regulation leaning over the highest human point of view relates to them. It focuses on a necessity to overcome responsibility for human future and thus avoid

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irresponsible behaviour which may destabilize the market, damage the partners, consumers, state and some other subjects which are somehow involved in entrepreneurship.

Current tasks of Business Ethics might be understanble thanks to realizing the seriousness of the situation in a new global economic and social environment representing qualitatively a new level of internationalization of economic life.
A new global environment gradually creates space for individuals, economics and societies to operate in information age. In such an environment, there will be new frameworks and rules of game according to which the new civilization will run (Klinec, Pauhofová, Staněk, 2009). In this environment entrepreneurial activities deal within its great part in arising serious problems in the world, in damaging citizens of this planet, society as well as the nature. New tasks of Business Ethics thus come out of the critical reflection of the actual situation in a new global environment and aim at regulation of entrepreneurial activities in this environment with the help of moral norms. Thus, in order to be in favour of all the societal subjects related to, directly or indirictly, and also in favour of sustainable life on the Earth.

It cannot be limited for the process of economic globalization to be connected with the growth of consumption, global consumption and global problems[1], global risks, etc. Business Ethics may help in moderating some negative phenomena and consequences in a new global environment. It presents economy based on "a human principle, which emphasizes that entrepreneurial activities are not purposeless but they are for people and made by people and appeals for entrepreneurship should be understood in a broader sense of social and ecological relations and it also calls for respect of ethics in entrepreneurship with the aim to eliminate or at least moderate negative phenomena connected with enrepreneurship.

Entrepreneurial activities in a new global environment are in a centre of Business Ethics on a global scale. In the past, in the times when Business Ethics arose, not enough attention had been given to this issue. Regarding the process of economic globalization and in a new global economic and social environment, there are new and new appeals for Business Ethics. They are connected with globalization which directly or indirectly gives demands on all entrepreneurial subjects which should be adapted to the conditions on a global market in a way that they do not harm people and nature.

2 Development of Business Ethics on a global level

As mentioned above, more solutions have been formed in relation of economy and ethics. One of them is to refuse the ethics with the fact that economy is the best ethics. Several authors consider a way of interconnecting ethical and economic ways and they base it on the fact that the economy is not an isolated system but one of the sub-systems of the society (Martoň, 1999).
Ethics and economy meet at four levels "depending on a reasonable level of aggregation of an individual bearer of action, i.e. on primary subject of action in economic activity". (Remišová, 2011, p.76)
On a global level, where humankind as the whole is a subject, on a macro-level, in which the society as such is a subject, on a mezo-level in which organization is a subject and finally, on a micro-level in which an individual becomes a subject (Remišová, 2011). There are no doubts that these four levels are connected, influenced and we cannot explore the ethics of

[1] As it is stated, it is not a coincidence that the global problems appeared in the time when the global economy was constituted, i.e. at a certain level of development of internationalization and interdependent process (Jeníček, Foltýn, 2003).

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business organization regardless the processes in a new global economic and a social environment.

As for illustration, a task of Business Ethics is according to Crane, Matten (2007):

- Clarify task of business in contemporary society,
- to provide a major contribution to societies, in terms of producing the products and services, providing employment, acting as an engine for economic development,
- to study of business situations, activities and decisions where issues of right and wrong are addressed,
- to help us understand more about the causes and consequences of malpractices, Business Ethics seeks to improve the human conditions,
- to help improve ethical decision making processes by providing managers with the appropriate knowledge and tools that allow them correctly identify, diagnose,analyse, and provide solution for ethical problems and dilemmas,
- to provide us with the ability to assess the benefits and problems associated with different ways of managing ethics in organization,
- to help cultivate business environment (mainly cultivate environment around entrepreneurial subject, environment in which the business is realized, as for example common interpersonal practices, strengthen loyality of employees, help creating good relationship at workplace but also good relations with other business partners, relations towards region in which business takes place, strengthen loyality of investors, contribute towards satisfaction of customers, etc.

Nowadays, business ethics focuses on problems, risks and threats complicating positive development of humankind on a planet. As the process of economic globalization extremely determines activities on all the levels of entrepreneurship and many times it complicates development of human society, as for instance it influences deepening global problems[2] as well as crises or threats in the world. Therefore, we consider paying more attention on a global level[3]. Also A. Crane and D. Matten consider the globalization as a key context for Business Ethics. As they say: "Globalization is defined in terms of the deterritorialization of economic activities which is particularly relevant for Business Ethics,and it is evident in three main areas –culture, law, and accountability." (Crane, Matten, 2007, p.18)

2.1 Actual appeals for Business Ethics on a global level

Many problems in a new global environment are connected with the development of global competition which is accelerated by technological and information transfer. The competition is an assumption for formation of a free market thanks to which demands for quantity and quality of product and service production increases. It constantly sharply increases on a globalizing market, regulation barriers between particular economies decrease, global work division changes from internation to the global by which also competition gets a new dimension and intensity. At the same time, new rules of competition fight and competition relations have been developed. In a global competition, those transnational or multinational companies become successful which deal with a business strategy of connection the local and international activities with the high ratio of global knowledge, flexible changes in employability and an ability to transfer production, marketing and managerial know-how from a country to country at considerably lower costs. Primarily, these companies are significant in terms of developmental strategies of global economy and their attempt is to find cost or strategic advantages not using their own comparative advantages but the advantages of

[2] Global problems are the problems threating future development of humankind and they are divided from several standpoints. As for example J. Mistrík divides them into social, political and environmental (Mistrík, 2014).

[3] According to A.Luknič – so-called global ethics in business.

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all the potential host countries. Social pressures for states and their citizens are connected with these attempts. As for example, the problem arises when big transnational corporations (BTC) decide to realize their intentions in countries which are advantageous with not only low tax rates but, in a way, they are willing to accept corruption behaviour.
BTC realize a form of economic pressure, they blackmail some districts and states under the threats of business. It brings also unpleasant consequences on employability, purchasing power in a region, also domestic suppliers, etc. Also these practices of entrepreneurial subjects confirm the opinion that: "honest competition is threatened in a global market." (Volner, 2006, p.48).A serious appeal for Business Ethics is spreading illegal business in a new global environment. In such an environment we can find different forms of illegal business (smuggling with people, global business with people, business with drugs, arms, spreading guns, flaming and maintaining regional wars and ethnical aggression, life threatening, international migration or illegal business with dangerous waste, etc.) which are in bloom due to new technologies, the Internet mainly which functions as a frontage for laundering money (Naím, 2008).
A key towards the illegal business is a growth of money laundering due to the fact that illegal money must be „laundered". Money laundering is not a business as such but also an irreplaceble mechanism of any other illegal business. M. Naím labels it as a mirror of a global grey economics[4]. A grey economics represents a sphere of an economic activity which in an area of a particular state avoids tax payments, legal laws are not respected, activities are realized without permissions and thus the state interests are deteriorated (Naím, 2008). The reason of its existence is an attempt of some economic subjects for quick capital cummulation.

Economic inequality and conflicts in the world contribute towards development of illegal business. On one hand, it is thus supported, however, on the other one, illegal business supports inequalities in the world, mainly difference between the rich North and poor South. And it also strengthens the power of some subjects.
Actual problems, towards which Business Ethics should pay attention, are connected with the global labour division in a new global economic and social environment. The global labour division is a reason for the fact that a necessary employability to a certain production is not concentrated on a territory of particular states but it is a subject of a global and planetary division. One of the biggest problems of the global economy, which is broadening the gap between the poverty of developing countries and the richness of developed countries, is connected with it.
Today we consider about bipolarization of the world which is divided into rich and strong countries on the one hand and the poor and dependant countries, on the other hand, by which so called outerclass is growing, i.e. a global, socially excluded class. Rich countries (the countries of the Global North) are those which are home countries for companies appearing as multinational corporations. Foreign investments come from there abroad.
Poor countries (so-called countries of the Global South) are those which accept investment from abroad and their economy gradually becomes dependant on other states. Attempts of some economic subjects reach economic prosperity and profit can also be connected with the growth of povery in socially weakest social levels as well as other parts of the planet. These are mainly countries of the global south, in which economic and social development markantly lag behind the developed states. Interests of some business subjects in these countries are obvious. They find there mainly the source for the cheap work force, cheap

[4] In the times of globalization we can see also black economy connected with criminal activities, drug distribution, financial frauds, etc.

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natural sources, places for dangerous waste, etc. Irresponsible use of natural sources and inadequate evaluation of those sources should be a focus of Business Ethics on a global level
The truth is that in attempt to beat the competition, the entrepreneurial subjects are forced to produce and offer the range of different products and satisfy specific needs of consumers.
The lack of natural capital[5] is an extreme limit for economic growth, as well as for satisfying some specific human needs. One task of Business Ethics is to point at the fact that an increase of predatory pumping of natural sources ignoring ecological demands regardless the consumption of non-renewable natural sources which is in a deep conflict with the rational economy. As Šikula warns, the price reflects insufficiently but sometimes at all direct or indirect ecological demands as well as prices of energend raw sources (Šikula, 2003).
A problem of natural source use is connected with the increase of consumption and strengthening consuming mentality of people. We point out entrepreneurship keeping consuming way of life, supports consumption and calls some "pseudoneeds", which is irresponsible. The truth is that the whole range of needs arises as a result of economic growth. It happens that many needs which people think are essential are in reality the needs of the market. Except of that, some consumtion subjects satisfying such needs have serious consequences.

The proofs of unreasonable economizing with natural sources are global environmental problems. Evident and hidden conflicts grow in a global environment, as well as the fight for governing energetic and water sources, living areas, etc. (Šikula, 2003). The global environmental crisis must be connected with irresponsible behaviour of economic subjects towards environment. It points at the deepening conflict between phenomena "the nature"–„ the culture", in terms of which the human builds the human world. It is given into the relations mainly with attempts of aconomic doers reach unlimited economic growth also with the growth of material consumption mainly in developed countries (so-called countries of the rich North). Last but not least, it is connected with exponential growth of human population.
We could continue with critical analysis of entrepreneurship in a new global economic and social environmnet and point at new challenges for Business Ethics. They confirm that "a hunt for profit" has become the source for global social shakes and conflicts in a new global environment. At the same time, a current human still more and more takes over the logic of the market, even though, the market and entrepreneurship should serve firstly to people and satisfy their needs.

3 Results and Discussion

Pointing at some problems in a new global economic environment covers some questions which should be dealt with Business Ethics on a global level. As for example, why it is not possible to prevent some entrepreneurhip subjects to increase economic growth by the ways which damage and threatens other social subjects on the planet and the nature? Why does not eonomic growth automatically provide increase of life quality but gets to the oposition of the valueable quality of life? It should be connected with reaching social development which is not only pressumposition of appropriate life level of people in the society but also the assumption of growing their life quality.

One of the task of contemporary Business Ethics is to point at the fact that even the possibility to move within a new global environmnet, broadening investments and e.g. freely enter less developed parts of the world with not so developed inhabitants, this does not approve entrepreneurial subjects to apply immoral ways of reaching profits, as for example to misuse

[5] Natural capital is a part of the nature which has utility values.

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local people or less educated people who are forced to provide their basic needs by any ways, in order to plunder natural sources, deepening existing global problems and aiming to new problems, risks and threats, threatening individuals, states or nature.
In some developed countries, many economic subjects currently realize that except of legal, productive, legislative and other norms, entrepreneurship should bear in mind also moral norms standing behind the entrepreneurial activities.
Regarding the fact that new problems arise constantly in a new global economic environment, part of which is the consequense of entrepreneurial subjects, it is necessary to revise and add some tasks of Business Ethics.

„If the economy does not fulfil the task of potential source for quality life of majority of population, a question – "to which system such a economy contributes?" must necessarily arise (Pauhofová, Staněk, Volner, 2013). A moral obligation of entrepreneurial subjects which remains actual nowadays, striving for the profit, in the way that the basic purpose of economy which is to serve to the life will be accepted (Rich, 1994). A following question arises:
Regarding the globalizing process Business Ethics must remind the task in which economy plays by providing applicable conditions for human life. At the same time, it should emphasize that economic doers should responsibly take in consideration the ways by which they attempt to fulfil human needs by which the profit is divided, but also work and social products among participants of globalizing market or among all the people of the worlds regarding the fact that every human has the right for dignified treatment and life. Recognition of such a purpose and realizing of a situation of people in some parts of the world, environmental situations, thus, it can reverse some attempts of entrepreneurship subjects to succeed in a global market. Business Ethics calls for that and its task is to moderate negative effects of global changes connected with the growth of global economy. At the same time, it should justify moral requirements and provide arguments for required forms of behavior in business in a way that they should be accepted.

Therefore, economic doers in a new global environment are required to be responsible for reaching economic growth as well as for the ways by which they attempt to reach this growth as well as for the growth to be connected with social development and increase of human quality of life on the Earth. At the same time they should overtake responsibility for economic growth not to cause degradation of social systems, devaluation of environment[6].
Last but not least, Business Ethics should point at the fact that business subjects become competitive also due to dignified behaviour at the market towards other participants of transactions thanks to use of humane ways and procedures in production, by product presentation, services and comodites. Attempts to minimalize use of natural sources but also wastes and polluting stuff strengthen their good name[7] in order not to threaten future generations. In order to remain in global competition, gain goodwill requires appropriate processes, methods from the point of view of technology as well as moral point of view.

[6] Negative aspects of a long-term growth has been dealt by Roma club and some other authors (Meadows et al., 1972; Forrester, 1971) in the 70´s of 20th century. Reports of Roma Club - Limits to Growth (1972), Beyond the Limits (1992) and others focus on a need of ecological and economic stability, sustainable to the far future.

[7] A term „goodwill" is used in Business Ethics for labeling a good name of the company or enterprise and it can substantially strengthen a position of that particular entrepreneurial subject on a market. I tis considered to be a result of a long-term positive operation of that subject and it reflects responsible behaviour on a market environment towards other subjects which are involved in business.

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4 Conclusion

Despite the fact that Business Ethics clarifies entrepreneurship as an activity with moral demands, and points at immoral practices in business activities, its task is to moderate and help eliminate negative phenomena and processes in a new global environment. As extremely important appears to be regulation of business activities in a new global environment with the help of ethics, and in the interest to moderate existing problems, risks and threats of global character. This task sounds general but more concrete tasks come out of it. It is connected with the requirement of entrepreneurial subjects to adapt to the conditions in a way that people and the nature do not suffer. Many problems faced not only by business subjects but also global citizens can be avoided in case when moral values are considered in particular economic processes and activities. Despite the fact that nowadays many business subjects do not pay attention to ethics in business, or searching for economic activities based on values and do not consider moral regulation for effective instrument of problem solution in entrepreneurship. This situation arises mainly in the countries in which the atmosphere has not been created in order to persuade economic subject that integration of humane views on business, considering moral values beyond entrepreneurship and respecting moral norms or bindings towards social subjects, it helps preventing or multiplying problems, rises and threats in a new global environment. Last but not least, respecting moral norms helps particular entrepreneurial subjects to improve their position not only in a domestic market but also European or global one. Thus, it represents for them a competitive advantage enabling reaching higher profits and improving its position on a market. Many business subjects still have not realized this fact. We agree with the opinion that economic reasons can significantly influence decision making of current businessmen whether to respect also moral norms. (Putnová, Seknička, 2007).

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Conceptual modernization and methodological support of courses in higher education pedagogy at Slovak University of Agriculture

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Abstract
The paper is aimed at the field of higher education pedagogy. There is description of the actual state of university pedagogical staff preparation and training and also describes the requirements for the profession of teacher in higher education. It deals with the latest educational needs of the staff and describes the transformation of the pedagogical and psychological preparation of the university teachers in Slovakia, particularly at Slovak University of Agriculture in Nitra. Some results of the survey among university teachers aimed at their educational needs and satisfaction with the courses in higher education pedagogy are available in the paper. The results originated as the outcome of the research project KEGA no. 026SPU-4/2013 "Conceptual content modernization and technical support of Higher Education Pedagogy Course for teachers at technical universities".

Key words*: higher education pedagogy, university teachers, conceptual change, improvement of higher education quality, didactics of higher education, educational and psychological preparation*

JEL Classification: *I20, I21, I23*

1. Introduction

Nowadays there are very few educational researches conducted in the field of higher education in Slovakia and also the theoretical discipline - Pedagogy of higher education has inadequate response in the academic field of Slovak higher education institutions. It is generally believed that universities are the top-level institutions in the educational systems. On the other side there exists constant criticism concerning the unequal quality of education and the overall quality of teaching process at these institutions. The requirements to improve the quality of university teaching are usually formulated as a challenge (such as the Bologna Declaration, 1999) or the recommendation of education policy documents (Adopted 1997, White Paper 2001). It is also included into the evaluation reports of accreditation commissions or other evaluation and expert institutions. Even the universities refer to the field of teaching process improvement in their development programs. But less are the particular changes and innovations enforced into educational practice. It is difficult to recommend general pedagogical principles, strategies and methods in a variety of learning situations that have a different character at higher levels than at lower levels of education. Therefore there is an urgent need to permanently develop pedagogy of higher education. On the other hand, there are various barriers and adverse circumstances of economic origin or barriers connected with human resources. According to the above mentioned, it can be summarized that there are many factors that determine the concept of university education, and this requires a deeper examination. The aim of this paper is to describe the transformation of the pedagogical and psychological preparation of the university teachers in Slovakia and to provide a brief description of the project solved at the Slovak university of Agriculture. Project KEGA 026SPU-4/2013 „Konceptuálna modernizácia obsahu a metodická podpora Kurzu vysokoškolská pedagogika pre učiteľov technických univerzít"(Conceptual content

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modernization and technical support of Higher Education Pedagogy Course for teachers at technical universities) was aimed at conceptual analysis and curriculum innovation in the field of pedagogy of higher education. The project KEGA that was solved at Department of Pedagogy and Psychology (in the present Center of Education and Psychological Counselling FEM SUA) oriented to design the new content of higher education course for university teachers and to innovate it in line with the latest requirements of the current scientific knowledge and needs of the social practice. It is important to watch both professional growth and the educational and psychological training of teaching staff as part of obtaining the scientific degrees and scientific-pedagogical titles.

1.1 Development of the pedagogical and psychological preparation of the university teachers in Slovakia

In the 70s and 80s of the 20th century in the context of criticism of universities has been proved the necessity to equip higher education teachers with skills for the improvement of teaching in differentiated educational settings, ie. in different types of studies, with diverse students in diversified institutions with different educational goals and outputs. So there was a need for teacher education, which was designed and implemented by specialized university institutes, providing courses, seminars or textbooks, which core was in higher education pedagogy. Higher Education pedagogy as a scientific discipline was developed also at some faculties in the Czech Republic and Slovakia. In the 80s of 20th century were in Prague and Bratislava constituted institutes – Institute of Higher Education Development - dealing with the problems of higher education, including teacher education. Both institutions were liquidated due to the change of higher education laws in the 90s. (Zaťková, 2014)

Worth remembering is the content and organizational model of teacher education, which was in the 80s designed and practically implemented as a so-called "System of increasing educational qualifications of university teachers" in the former Czechoslovakia. This system was created following the model of Western countries and in its time was a progressive act. Further education system was codified according to edict no. 39/1980 that was modified in 1983 as obligatory for all university teachers. System included two levels of teacher education:

- basic study of higher education pedagogy, that was obligatory for young teachers up to 5 years of experience in higher education institutions,

- specialized study of higher education pedagogy, which was obligatory for all teachers up to 10 years of experience in higher education institutions. (In Tollingerová, 1983)

The first level of teacher education included general issues relating to higher education pedagogy concerning education at the university, student's personality, academic profession, teaching forms, methodological innovations etc., always taking into account the psychological aspects.

Second level of teacher education was focused on the issue of teaching specific courses based on the constitution of university didactics. System of increasing educational qualifications was organized only at the platform of experimental verification. Organization of the courses included teaching blocks and self-study, as well as lesson observations.

Basic studies were completed by a board examination, which consisted of pedagogy, psychology and didactics. Specialized study was organized similarly and also followed by examination from the relevant special didactics. For the purpose of self-study were created sets of learning texts in the eightees of 20th century (by authors: J. Kotásek, P. Byčkovský, J.Mareš, J.Špůr, D. Tollingerová, M.Řehořková etc.). At the same time in Slovakian part of

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Czechoslovakia emerged edition of textbooks series on topics in higher education pedagogy, didactics and psychology. Authors who contributed were for example: J.Štefanovič, J.Grác, R.Štepanovič, V. Prusáková, M. Černotová, etc. (In Zaťková, 2014)

The system of university teachers training come to the end in 1989 with the socio-political changes in the country. After that year the higher education pedagogy stagnated in its development.

Vašutová (2010), Czech expert in higher education, notes that when we evaluate the "system of increasing the educational qualifications of university teachers"with today´s broader view, we probably would not avoid the criticism. The main problem was that completion of higher education pedagogy was mandatory, regardless of individual needs and pervasive ideology that penetrated the study materials. On the other hand, positive results have been proven in influencing educational work of university teachers - beginners.

In the 90s the educational courses and seminars in pedagogy at universities occurred only occasionally as an interest and they were optional. Over the time there began again to be rediscovered the need for teacher training of novice university teachers. Today, universities themselves organize pedagogical education for their staff as a teaching minimum, according to their needs. Some universities provide it as an obligation, some as optional course. Some of the higher pedagogy courses are conditioned by internal regulations of the university or as criteria for habilitation process; some of them are accredited by IGIP (http://www.igip.org) or as a part of one-shot projects. Not always, however, the content and didactic design is related to university specificity. In the last decade, we can see a positive trend in an effort to increase the quality of the educational process at some of the Slovak universities. Especially universities of technical orientation are beginnning to organize teacher training courses for their staff (eg. SUA, Slovak University of Technology in Bratislava, Technical University in Košice, University of Economics in Bratislava).

1.1.1 Development of higher education pedagogy at Slovak University of Agriculture

Development of higher education pedagogy at Slovak University of Agriculture in Nitra (SUA) does not lag behind the trend. Tradition in pedagogical preparation of the university staff continuously maintained at the SUA to the present day with some modifications. In 1964 was established Department of Education at former College of Agriculture in Nitra (later SUA). In that year was the department mandated by the school administration to enable pedagogical staff of the university to acquire the necessary knowledge in the field of Educational Sciences and Psychology. In the eighties of 20th century the System of increasing educational qualifications of university teachers was also applied at College of Agriculture. Since the establishment of the department until the year 1989 eight courses with about 300 graduates of Higher Education Pedagogy were organized. (Zaťková, 2014)

After the year 1989, when the System of increasing educational qualifications of university teachers in Slovakia was abolished, SUA in Nitra became the only higher education institution in Slovakia, which continuously pays attention to the pedagogical training of its´ staff. University administrators hereby declare interest in improving teaching, bearing in mind the axiom that teacher in tertiary education must, in addition to professional expertise, have a quality pedagogical and psychological preparation. This requirement was part of the minimum standards for the habilitation procedure and procedure for the appointment of professors at SUA valid from 18.12.2008 up to 2015: - "criterion of educational activities - point f) Teacher education (basics of pedagogy)" - and this applies equally to internal staff of

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SUA and staff from other universities, who apply for obtaining the scientific degree at SUA. "(Slovak University of Agriculture, 2008).

Today are courses only optional. Pedagogical training is a tradition at SUA and organization and its´content is being constantly innovated since the times they were established. Two cycles of one-semester courses run in the academic years 1964-65 and 1966-67. Some of the lectures from *Theory of education, Psychology, Methodology* were provided by lecturers from the Department of Higher Education Teaching from Comenius University in Bratislava. Courses were later transformed into three semester study. Such a course in the academic year 1971-72, and the next course in the year 1973-74 were completed by a total of 53 teachers and the courses were fully provided by the Department of Education and Sociology (today Centre of education and psychological counselling). (Hraška, 1976)

There is a reference to the content of the study in 1985. (Majerčák & Ondruška, 1985) Following disciplines were lectured: *Theory of Communist Higher Education* (8 lessons); *Psychological Aspects of the Educational Process in Higher Education* (12 lessons); *Sociological Aspects of Education and Teaching at University* (8 lessons); *Higher Education Didactics* (12 lessons), *Methodological Factors of Teaching at University* (12 lessons), *Basics of the Theory and Practice of Teaching Vocational Subjects in Higher Education* (12 lessons), *Modern Educational Tools* (6 lessons), *Methodology* of *Educational Research* (4 lessons); *Basics of Aesthetics and Language Culture* (4 lessons). All disciplines were supported by textbooks. Participants also completed six mandatory lesson observations and they gave a final lecture that was assessed by the commitee. The study ended with defense of the final thesis and it was connected with pedagogical and psychological questions on the final work. (Majerčák & Ondruška, 1985) In 1989 in a speech of that time Dean we can find a reference to the implementation of university pedagogy as follows: In addition to supplementary teacher training course, department also organizes in collaboration with the Comenius University in Bratislava specialized study of university pedagogy for teachers from College of Agriculture. This study is carried out annually in the form of selected lectures on current topics in psychology, pedagogy, sociology and didactics of vocational subjects at the College of Agriculture in Nitra. (Hrmo, 1989)

After 1990 fundamental changes entered the educational system in Slovakia. Pedagogical education of university teachers was no more required by law. This led to attenuation of the development of higher education pedagogy in Slovakia. But following the tradition of university teachers' education also at the beginning of the new millennium courses continued at Slovak University of Agriculture, but with the slightly modified content (Theory *of education and didactics, Psychology, Organization and management of higher education, Rhetoric*, *Sociology*- 60 lessons divided into three week training sessions).

Time devoted to the lectured disciplines was the accompanying feature of the course innovation. Number of lessons varied in different years from 60 to 80. Course in the years 2009/2010 consisted of the following disciplines: *Higher Education* (16 lessons); *Rhetoric* (lessons); *Biological bases of learning* (4 lessons); *Creation of understandable text* (8 lessons); *Selected topics in sociology* (4 lessons); *Modern Educational Technology* (8 lessons); *Selected Topics in Psychology* (12 lessons); *School legislation and school management* (12 lessons); *Final thesis*; *Educational performance*; *Final colloquy*.

Time devoted to the next year teacher training course for the period 2011 - 2013 remained unchanged. Course was organized in three sessions of three-day workshops (each session in 24 lessons). Face to face training and selfstudy were allocated into three semesters. Little changes were done in the content (the following disciplines were lectured: Basics of

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Education and Adult Education (16 lessons); Selected Topics in Sociology of Education (8 lessons); Modern Educational Technology (8 lessons); Selected Topics in Psychology (16 lessons); Educational Communication (8 lessons); Higher education didactics (16 lessons); Final thesis; Educational performance; Final Colloquy).

The newest trend in teacher education at SUA today is "Engineering Education" according to the standards prescribed by IGIP association (Gesellschaft für Internationale Ingenieurpädagogik Klagenfurt/International Society for Engineering Pedagogy). Courses of higher education pedagogy at SUA are based on the curriculum of IGIP (http://www.igip.org/pages/membership/files/crit_accred.pdf). Competency profile of teacher in higher education of future technically oriented professionals, according to International Society for Engineering Education (IGIP) is based on two pillars: quality vocational education and practical experience and skills acquired in the framework of special training in the field of education. University teacher should dispose with pedagogical, social, psychological and ethical skills, didactic, evaluation, organizational and management skills, with the ability of self-reflection and further personal development as well as the ability of appropriate pedagogical communication in practice. SUA has been accredited in 2015 as Training Center for Engineering Educators. IGIP accredits training centers for "International Engineering Educators" which conforms to IGIP's curriculum for engineering pedagogy. These centres have to be reaccredited every five years. Structure of the currently accredited course for university teachers is listed below in the table.

Table 1: List of all modules of the engineering pedagogical education.

Description of the modules		**ECTS**
Core and basic modules		
PM1	Theoretical and Practical Engineering Pedagogy	**6**
PM2	Didactics	**2**
Theoretical modules		
PM3	Selected chapters from Psychology and Selected chapters from Sociology	**3**
WPM	Ethics and intercultural competencies	**1**
Practical modules		
PM4	Scientific Writing and Pedagogical Communication	**3**
PM5	Working with Projects	**1**
PM6	Educational Technology	**2**
Electives		
FCP	Teaching practice Thesis	**4**
In Total		**22**

(Source: Application Form for Engineering Pedagogy Training Courses SUA, 2015)

2. Data and methods

The actual curriculum of the course and its´accreditation is one of the results of the research project KEGA no. 026SPU-4/2013 “Conceptual content modernization and technical support of Higher Education Pedagogy Course for teachers at technical universities” that was financed

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by the national grant agency during the years 2013-2015. The project aimed to expand knowledge in the field of applied educational discipline Higher education pedagogy and to modernize and rebuild the curriculum of courses in higher education and to harmonize it with the current requirements and practical needs. Partial aims were:

- To propose appropriate ways and forms of implementation of higher education pedagogy into the process of teacher training;

- Monitoring the impact of courses in higher education at the level of ongoing evaluation and analytical studies, including a survey among the teachers;

- Analysis of educational needs and motivation of university teachers in further education.

Aims were fullfilled on the basis of information retrieval and document analysis, comparative studies and empirical research using questionnaire surveys. Qualitative methodology was used.

3. Results and discussion

Among the selected reults we can briefly conclude that during the period of the project realization a new study plan was created and verified by the former Department of Pedagogy and Psychology (since the 1st of June Centre of Aducation and Psychological Counselling) and the group of 20 teachers from the six faculties of SUA graduated from the Higher education course. Verification of the course in 2015 led to the application for the accreditation of courses within the international organization IGIP and the course was successfully accredited in October 2015.

Within the project was published one textbook - *Selected chapters from the higher education pedagogy* (Vybrané kapitoly z vysokoškolskej pedagogiky, 2015), which is intended as study text for the courses. Textbook has a practical contribution to the further education of teachers. Two books of scentific works were published that expand the resources in the field of higher education. In addition to these publications 60 other texts and articles were published in conference proceedings and journals and two conferences were organized in the years 2013 and 2014 by Department of Pedagogy and Psychology ("*Teória a prax vysokoškolského vzdelávania* "- international electronic conference, „*Pedagogika a sociológia vo vysokoškolskom vzdelávaní*"- international scientific conference). Component part of the project was also survey on the motivation of university teachers to their further education and educational needs in their teaching proffession. Views of the participants on the organization and curriculum of the Higher education pedagogy course were also examined and the results will be further used for the teacher training improvement at the Slovak agricultural University.

Questionnaire was administrated to all 20 graduates via e-mail, but only 12 questionnaires were filled in. Survey was done among participants of the course with teaching experience from 3 up to 15 years of pedagogical practice and one participant with teaching experience more than 16 years. Half of them had no previous teacher education and the second half of them graduated from Pedagogical Supplementary Studies for Secondary Vocational Education.

The most important motivator of course attendance was the prospect of professional growth and the requirement of the head of department. The absolute majority of respondents expressed interest in the course, because the scientific-pedagogical growth of university

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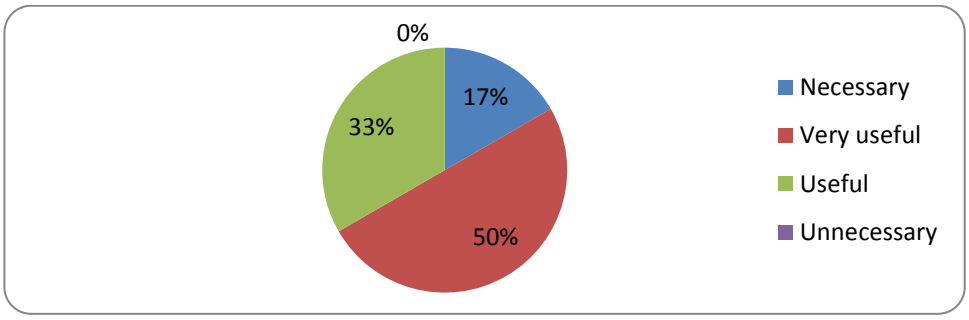
teachers has for a long time been conditioned by the requirements of the university management as one of the criteria for habilitation and inauguration process (until 2015).

Participants indicated that as a part of their further education they would voluntarily chose mainly foreign languages, than followed psychology, ICT courses and pedagogy.

Survey showed that teachers feel the greatest individual asset of the course in the development of their knowledge in the field of pedagogy, psychology, educational communication and rhetoric. In the field of higher education pedagogy participants would prefer more lessons from didactics and courses aimed at application of new pedagogical and psychological knowledge into teaching practice.

Assessment of the importance of courses in higher education according to the opinions of respondents is shown in the graph 1.

Graph 1: Importance of the course according to respondents



Source: Own computations of the author

Evaluation of available study resources found out that graduates of the course have enough opportunities to access adequate study sources only three respondents state that they have partial access to adequate resources. As obstacles to their pedagogical development majority cited lack of time, two respondents have no obstacles, three teachers stated lack of finance and one teacher stated that their head of department did not allow them connection with the practice in the form of activities outside the department.

Among the forms of organization, half of teachers cited that they would prefer e-learning forms and among the rest of answers were cited following: specialized courses, discussions on current topics, workshops to exchange experiences, group discussions and non-formal seminars organized with the participation of experts, interactive workshop and forum.

Course participants feel their own weaknesses particularly in the following areas - mainly in the area of application of a variety of teaching methods (60% of respondents) and then follow the creation of didactic tests, creation of study texts and teaching materials, working with ICT.

According to the majority of teachers, course at SUA has *met their expectations*. In one case was the answer *no* and one teacher stated that only *partially were met their expectations*.

Teachers assessed how passing the course led to development of certain selected areas of their proffession and competencies. They had to select one option from the scale 1-5 (1 – absolutly no/ 5 - definitely yeas). The results are shown in the tables 2 and 3 below.

Table 2: Opinions on contribution of the course in development of the selected areas

Selected areas of proffessional development	Average answer (from 1 to 5)
I learned how to teach	3.25

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I gained knowledge about new trends in pedagogy	3.91
I gained knowledge from other disciplines than engineering	4.08
I increased my professional competence	4.08
I met new people	4.33
I learned to deal with problematic situations in teaching	3.33
I increased my chance of getting / keeping a job	3.08
I gained points for habilitation process	2.83

Source: Own computations

Table 3: Opinions on development of teacher competencies after passing the course

Competence	Average answer (from 1 to 5)
Pedagogical, social, psychological competence	3.91
Didactic competence	3.66
Evaluative competence	3.58
Organisational (management) competence	3.33
Self-reflective and developmental competence	3.83
Communicative and interpersonal competencies	3.83

Source: Own computations

Based on these findings, we conclude that courses have the ambition to really fulfill their purpose and motivate university teachers to lifelong learning, to develop cooperation and learning environment, which ensures the satisfaction of students and teachers. It helps to increase the success of university education and develop professional competencies of university teachers. University teachers evaluated different areas of the course in the upper part of the scale. Some of the fields were just slightly above the average evaluation and to these aspects should be paid more attention in the future courses. Despite the average answers, no comments for courses improvement were suggested by the graduates. Only three of them state that course is necessary for all teachers in the tertiary education and the course structure is appropriate.

Conclusion

The lifelong learning programs for teachers in higher education need to monitor both professional growth and especially the pedagogical-psychological readiness of the staff as the part of obtaining their academic degrees and academic titles.

Improvement of teaching is based on respect of the learning needs of students and building on teachers´ own experience, but also on experience of other colleagues. Impact on enhancing the quality of tertiary education has also the acquirement of theoretical knowledge in higher education pedagogy and their reflection in the educational practice. Continuous improvement of teaching and learning process requires from teachers to constantly rethink, analyze and evaluate their own work with the students and to try improving it, to innovate. Therefore, regular self-education, development of teaching competencies, improvement of methods of teachers´ work and improvement of teaching methodologies are very necessary for the work of university teacher.

In connection to the previous text, there is a great need for developing a comprehensive system of educational and psychological training for university teachers. This requirement periodically appears from the 70s of the 20th century in different forms. In our paper we pointed out the importance of professionalism and the quality of teachers in higher education. In a small historical excursion, we reminded our tradition in university teacher education. Currently, there is no official requirement for teacher in tertiary education to complete basics of pedagogy and psychology, or to complete a course for beginning university teachers, as it was in the past. University teachers have many options for free democratic conceiving of such education. On the other hand, the teacher is responsible for the results of their teaching activities as well as for development of their professional and educational qualifications. This aspect of the work of university teachers is not always sufficiently appreciated and often, when assessing the qualifications of teachers there are taken into account the results of their professional activity and less regard is for the results of their educational activities.

Practical and most important outcome of our project was to develop an innovative model of courses in higher education pedagogy with regard to developing the educational and psychological competencies of university teachers, which was actually verified in practice. Teachers, who passed the course often emphasize that teacher training should be highly targeted and based on the findings of the particular educational needs of the participants. In connection with the above mentioned our goal to the future is to constantly continue in providing pedagogical-psychological education for them and to innovate the content and organization of the courses with regard to their opinions.

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Information as a base of information and communication technologies

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Abstract
This article deals with an issue of information and measurement of its quantity. In the presented article fundamentals of the information theory will be presented. Marginally, authors will also be dealing with mathematical fundamentals of quantification of information and the attention will also be paid to some specifics of the rate of information. The main motive of the article is to clarify chosen specifics of the rate of information that will be shown on simple examples from educational practice. As a subject of quantification, statements regarding to the phenomenon of "Roll of the dice" will be used. Through application of well-known mathematical relations and conditions authors try readers to understand problems of the measurement of information and highlight its specifics in the group of commonly known rates. The conventional theory of information is supplemented by selected examples such a way that readers should understand basic principles of the theory of information.

Key words: *information, rate, quantification, statements*

JEL classification: *A33, C89, Z00*

1. Introduction

Nowadays, many authors deal with the issue of information and communication technologies (thereinafter “ICT”), but in this article we would like to highlight the essence of this modern concept. The basis of this concept is the information itself and possibilities of its transformation and transfer. Surely we all agree that ICT would not be here if in the human history, starting with the period far before Christ, there were no needs of human beings to communicate each other including communication and storing knowledges in information. Certain forms of "ICT" could also be identified in the history. They have passed through several development stages up to the current “face” – the information age, which is knows almost by everyone.

There are many different definitions of the term “ICT”. For instance Molnár (1993) and Štoffová (1998) define the ICT like as a technology (as computers, telecommunications, data transfer and organization) that is used to processing the information as well as its software and organizational arrangements. According to Smitek (1998), ICT represents methods, procedures, and form of collecting, storing, processing, verification, evaluation, selection, distribution and timely receipt of the necessary information in required format and quality. In a broader sense, this term also includes technology (hardware) and software resources, to ensure supporting and implementing of mentioned activities. Kolenička (1998) argues that ICT is a system of methods, programs, procedures, activities that realize the maximum utilization of close and distant sources through communication in computer networks in order to find the optimal solution of defined (given) problems or achieve goals or meet needs. [1]

In connection with the presented article, however we do not deal with the physical aspects of ICT, because the core of our concern will be just the abstract – non-physical side of ICT starting with the information itself.

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2. Information in the theory

There are many definitions of the term "information". Although the initial understanding of the information appeared in the social sciences, the most heated and most prolific development of the perception of information has been taken in the context of information theory and cybernetics.

The basic concepts of information were laid by C.E. Shannon. He did not consider as the information any message, but only the message that was able to reduce the uncertainty of the receivers (recipients) of information. The uncertainty exists when there is a choice of several options, which is typical for almost any human activity, but also for cyber technology, for animate and inanimate nature, too. American mathematician Norbert Wiener (the founder of cybernetics) characterized the information as that part of report (announcement) respectively such report, which was headed from the source to the recipient, who needed it to perform its duties. He emphasized that such information had to contain something new – original and which was unknown to the recipient and able to expand its knowledge regarding the display of the objective reality and at the same time eliminate or at least reduce the degree of the receiver´s uncertainty of his conduct.

Information as the termis not typical just for the field of cybernetics. There are many theories that deal with the concept of information and which emphasize such kind of aspects of the information that are not typical for the cybernetics and that are not of its first importance. Mainly the semantic and pragmatic information theories should be mentioned. In the 60s of the last century different cybernetic variants of the theory of information value appeared which used game theory, theory of algorithms and theory of optimal management. The process of the development of the concept of information is still not finished and many new disciplines "create" new views on the concept of information. [4]

The development of the computer technology led to the emergence and development of new fields. In the 70s of the last century a new scientific discipline "the informatics"arose on the basis of Computer Science. The definition of the subject of informatics was specified at the International Congress in Japanin 1978. The areas related to the development, production, utilization, material and technical provision and organization of information processing, including industrial, economic, administrative, social, and political actions are the subject of informatics. Based on it the informatics explores laws of creation, processing, transmission, use, preservation and protection of information. The informatics is one of the most rapidly developing sciences. Knowledge from this discipline is immediately putted into practice and brings a significant economic effect. The process of collecting, processing, transmission and storage of information refers to as information process.[6]

But let us return back to the information and its merits. From the definitions mentioned above, we can therefore say that the information is a message that falls within one of the possible events from the set of existing phenomena, which reduced the recipient ignorance of this phenomenon. It is the idea expressed in the language (using the symbols) expressing the state of an object and its manner.

2.1 Understanding of the concept of information

Firstly, it is important to differentiate between the term "information" and the term "data". Most people believe that the terms are interchangeable and have the same meaning. However, there is a strict difference between them. The term "data" can represent any character, text, words, number, pictures, sound, or video and, if not put into context, means little or nothing to

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a human. However, information is useful and usually formatted in a manner that allows it to be understood by a human. [3]

The data is each message regardless of whether it contains any information content or not. In other words we can say - whether a message is able to tell us something new or not. The data are messages that reflect some facts about processes or about elements of the real world. The data could be considered as letters, numbers, words, characters, or its combinations. All data have some information content. If the data do not give any new information to its receivers, the information content of such kind of data is zero. [6]

Based on this we can derive the relationship between the data and information – each single piece of information must be a datum, but not each datum must be a single piece of information with nonzero information content for its receiver. Sample of these differences is given in Table 1.

Table 1:Differences between the terms "information" and "data"

	Data	Information
Meaning	Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.	When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.
Example	Each student's test score is one piece of data.	The average score of a class or of the entire school is information that can be derived from the given data.
Etymology	"Data" comes from a singular Latin word, datum, which originally meant "something given." Its early usage dates back to the 1600s. Over time "data" has become the plural of datum.	"Information" is an older word that dates back to the 1300s and has Old French and Middle English origins. It has always referred to "the act of informing", usually in regard to education, instruction, or other knowledge communication.

Source: http://www.diffen.com/difference/Data_vs_Information[5]

From knowledge of terminological and content differences between the data and information, it is possible to determine two main characteristics of information:

1. Measurability (how much of information is in the message – the amount of the information).
2. Addressability (each information has its own receivers; concerning its content it may be characterized as relevant – useful or irrelevant – useless information).

Mainly the first characteristic of the information will be discussed in the paper in more details.

2.2 Measurement of information

Before the measurability as the specific feature of the information will be clarified, we need to find out firstly where the information is located. Statements are the common carriers of any information. We know that every statement is an indicative sentence with the sense to decide whether it is true or false. Remarkably the truth value of statement is unrelated to the amount of information contained in the statement. Subsequently, if we want to be able to measure the information, we need to define "rate of information". In general, a rate in mathematical terms is a function that each set of an appropriate system of subsets of the X set assigns a real number such that certain conditions are met, so called axioms of the rate. Axioms of the rate

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capture essential characteristics that are required from the function that expresses a size of the set. Some example for understanding of the concept of the rate is shown in Table 2 – commonly used rates.

Table 2: Commonly used rates

Subjects of measurement	Rate of the subjects	Measurement units
set	number of elements	pcs
distance	length	m, cm, mm
area	content	m^2, ha
space	volume	m^3, l
mass	weight	kg, g, t

Source: authors

The rate is the central concept of the theory of measure, which aims to study abstract structures, which allow mathematical study of the quantity concept. The term of the rate has many applications, especially in theory of integral, theory of probability as well as theory of information.

Let us consider a question what type of rate can we use for measuring of information as a subject of measurement. The answer was given by Claude E. Shannon in his theory. In a landmark paper written at Bell Labs in 1948, Shannon defined in mathematical terms what information is and how it can be transmitted in the face of noise.

From the mathematical requirements imply that the rate of information (ref. φ) is such representation of an appropriate structure of set (ε) that a positive real number is assigned to each element of this structure:

$$\varphi: \varepsilon \rightarrow \mathbf{R}^{+}$$

The rate of information (φ) is called the amount of information and the smallest measurement unit of this rate is a bit. From the definition we also know that 1 bit is the amount of information which is obtained from any message about one of two possible states which were both equally probable.

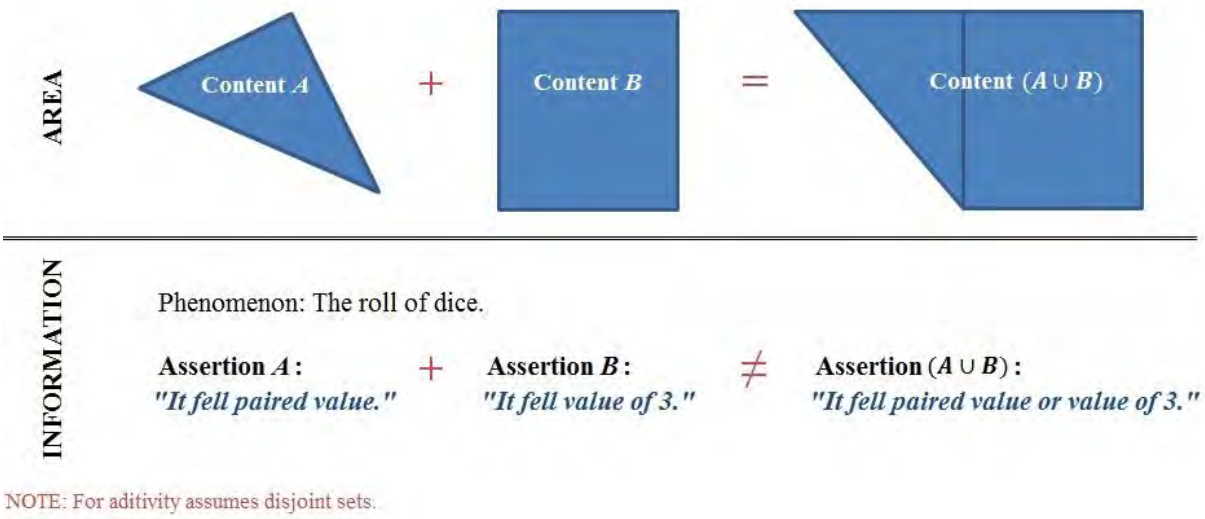
More detailed study of this rate shows unusual properties that are the essence of the problem addressed in this article. The amount of information is not common additive rate, as the standard rates (shown in Table 1). The problem of the additivity of the information is shown in the Figure 1.

2.3The amount of information

Shannon defined the quantity of information produced by a source (for example, the quantity in a message) by a formula similar to the equation that defines thermodynamic entropy in physics. In its most basic terms, Shannon's informational entropy is the number of binary digits required to encode a message. Today that sounds like a simple, even obvious way to define how much information is in a message. In 1948, at the very dawn of the information age, this digitizing of information of any sort was a revolutionary step. His paper may have been the first to use the word "bit", short for binary digit. [2]

http://dx.doi.org/10.15414/isd2016.s9.01

Figure 1:Non-additivity of information



Source: authors

As indicated in Figure 1, instead of use the addition operation (+) there is necessary for the amount of information to use other operation which keeps the original properties of additivity - so called ring operation (∘). Then we can say that information is pseudo-additive.

Thus, what mathematical relationsare true for the amount of information?

To quantify the information, which is obtain in the statements we can work with two fundamental mathematical relations resulting from:

- elementary definition of the information (by Shannon)

$$\varphi(A) = -\log_z P(A) \tag{1}$$

- required characteristics of the pseudoaditivity

$$\varphi(A) \circ \varphi(B) = -log_z(2^{-\varphi(A)} + 2^{-\varphi(B)}) \tag{2}$$

3. Quantification of information in practice

In this part of the article we attempt to apply a relatively difficult theory about the amount of information on a few simple examples of propositional experience. Through statements about selected phenomenon (convenient to illustrate the beauty of this theory is a phenomenon “Roll of the dice") we can point out the interesting and important features of information.

Let's start with an example no. 1a - Let us have two statements about the Roll of the dice:

A: "In the roll of the dice fell paired value.

B: "In the roll of the dice fell value of 6."

Intuitively we feel that the statement B provides more information than the statement A, however, the statement B is a subset of the statement A.

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Through application of known mathematical equation (1), we can also calculate our assumption:

$$\varphi(A) = -log_2 P(A) = -log_2 \frac{1}{2} = 1 \text{ (bit)}$$

$$\varphi(B) = -log_2 P(B) = -log_2 \frac{1}{6} \doteq 2{,}58 \text{ (bit)}; \qquad \varphi(B) > \varphi(A) \qquad (3)$$

On the same example (no. 1b) we can demonstrate that the amount of information φ is not an additive rate.We know that the following relationships hold true for the given statements:

- for the statements:$A \subset A \cup B$, $B \subset A \cup B$ (4)
- for probability of the statements: $P(A) \leq P(A \cup B)$, $P(B) \leq P(A \cup B)$ (5)

From relationships of probability of the statements (5), by compiling the system of inequalities and its dealing with appropriate mathematical editions, we get the statement:

$$\varphi(A) + \varphi(B) \geq 2 * \varphi(A \cup B) \geq 0 \quad \Rightarrow \quad \varphi(A) + \varphi(B) > \varphi(A \cup B) \qquad (6)$$

We have already shown that the classical additional operation (+), in the case of the amount of information, is not applicable. Let us therefore, in example no. 2, verify another mathematical equation (2), which should work in this case and let us try to quantify the amount of information of statements by the operation ring (∘) replacing the traditional operation plus (+) to count the amount of information.

However, it should be borne in mind this relationship can only be used for disjoint statements about the same phenomenon. Therefore let us edit the initial statement B as follows:

B: "In the roll of the dice fell value of 5."

Then we can pseudo-sum (by operation ring) the amount of information as follows:

$$\varphi(A) \circ \varphi(B) = -log_2\left(2^{-\varphi(A)} + 2^{-\varphi(B)}\right) = -log_2\left(2^{log_2 P(A)} + 2^{log_2 P(B)}\right) =$$
$$-log_2\left(P(A) + P(B)\right) = -log_2\left(\frac{2}{3}\right) \doteq 0{,}58 \text{ (bit)}$$

The operation ring substituted characteristics of thecommon census, which represents the unification of a set in the theory sets and in the level of statements it represents disjunction - logical statements operator "or". Then we can create a new statement, which represents A union B, it leads to the statement C as follows:

C: "In the roll of the dicefellpaired value or value of 5."

By applying the equation (1) we can verify if the operation ring (2) is, in fact, the appropriate way to sum the amount of information:

$$\varphi(C) = -log_2 P(C) = -log_2 \frac{4}{6} \doteq 0{,}58 \text{ (bit)}$$

4. Results and discussion

In relation to the presented examples, we can draw conclusions and further discuss the rate of the information and its mathematical properties.

In the example no. 1a we have shown that the statement B, which appearsto be smaller, contains more information than the statement A. While the statement Bis a subset of the statement A. And therefore it is true that $B \subset A$ but $\varphi(B) > \varphi(A)$.

In the example no. 1b we have shown that the rate of the information is not additive because this argument is true: $\varphi(A) + \varphi(B) \neq \varphi(A \cup B)$.

Finally, in the example no. 2 we have verified,under the required conditions,the suitability of replacement operation for counting the amount of information called the operation ring by the formula (2).

As we can see from these examples, throwing the practical application of the known theory of the information on the appropriate statements it is possible to clarify more detailed concepts of the theory of information. Apart from these examples, there are a number of other interesting mathematical properties of the information that may be studieddeeper and enjoyed their excellence.

5. Conclusion

Nowadaysit is very modern to take an interest in IT and everything related to the new technical achievements. But there are only few people who are interested in the nature of functionality of this common part of our world, which is a shame in our opinion.
Referring to the mathematical basis of quantification of information we wanted to emphasize the specifics of rate of information, which is called the amount of information. In this case, a significant difference in comparison with the commonly used rates is a fact that the amount of information is not an additive rate. In spite of this fact, we have shown how it can be added (pseudo-added) an amount of information content of two disjoint statements.
The main purpose of the article was to stir the waters up in the ICT section with this article and get readers to deal with the abstract mathematical level of the information itself. We believe that our article inspires current fans ofinformation world to increase their interest in information and its exceptional mathematical base.

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University network with security aspects and redundancy to ISP

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Abstract
In this paper, we want to show the use of modern technologies for communication among individual DTCs, especially for the communication model and the technique, based on the fiber optics. This new concept, so called Wavelength division multiplexing (WDM), uses multi wavelength approach for the communication on a single optical fiber. Further, we deal with the main causes of a possible communication breakdown among DTCs and to ISP and suggest corresponding solutions for their elimination. We consider the cloud consisting of the whole bulk of communication, among its all blocks, virtualized machines (VMs), data processing, their content, sharing and access planning to individual communication. At present the most spread model of the failure elimination is the artificial built in redundancy of active and passive component parts of the communication network.

Keywords: *availability, communication, datacenters, network, security*

JEL classification: *L86, D85, L63*

1. Modern datacenters and Cloud virtualized services

The last decade has seen the rise of the DTC computing in practically every application domain. The move to DTC has been powered by two separate trends. In parallel, functionality and data usually associated with personal computing has moved into the DTC; users continuously interact with remote sites while using local computers, whether to run intrinsically online applications such as email, chat, or to manipulate data traditionally stored locally, such as documents, spreadsheets, videos and photos. In effect, modern architectures are converging towards cloud computing, a paradigm where all user activity is funneled into large DTC via high-speed networks. Simply speaking, cloud computing is a set of computers, services or infrastructure. Delivering services is reducing every day work of users (clients), service providers, but also IT specialists. Cloud allows to offer more access services, reduces infrastructure delivery time from weeks to hours and reimbursement for really provided sources and services only [1].

Let us give some typical services provided in modern cloud computing DTC [2]:

- Infrastructure as a service (IaaS),
- Platform as a service (PaaS),
- Software as a service (SaaS),
- Storage as a service (STaaS) ,
- Security as a service (SECaaS),
- Data as a service (DaaS),
- Business process as a service (BPaaS),
- Test environment as a service (TEaaS),
- Desktop as a service (DaaS),

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- API as a service (APIaaS),

A critical implication of the DTC computing model is that the user of the online service expects the same performance of the application as that, running on the desktop computer, immediately responsive as a desktop application. User expects the service to store data reliably and always and immediately available. For service providers, delivering on this expectation, it is an engineering task of immense proportions. DTC are composed of thousands of failure-prone components and exhibit a bewildering array of failure models. Each level of the SW and HW stack has its own litany of error models, ranging from simple to byzantine – hung machines, blown fans, corrupted disks, bad network cards, overloaded routers and switches, bugs in SW, rogue malware, partitioned networks - this list is endless. When faults occur, enterprises have to react extremely quickly to prevent service down-time.

Existing reliable communication protocols are reactive, and have an associated cost and latency of reaction. In many cases, they react too slowly to the packet loss. And often, they over-react – flooding the system with recovery traffic that potentially causes further data loss, as well as throttling back excessively on sending speeds to avoid more loss. Protocols such as TCP/IP were designed for congested public networks and do not work well in the high-speed networks deployed within and between DTCs.

2. Trnava university network

Let us show first the general scheme of communication among individual DTCs on example of DTCs in Trnava University. Trnava University has three locally separated DTCs, connected via fiber optic connection. Network connectivity is designed on the Cisco technology with security from the same company and application firewall from Checkpoint company. Let us touch first the problem about general topology, connectivity and all special features of the communication system among DTCs.

2.1 Transmission lines aggregation (TRUNKING)

If we want to speak about the communication among individual DTCs, we must first show, how is network balanced. Cisco technology enables the setup of the network for excessive data transfer. Our project requires a good and stable network backbone, with the conservation of the required security level. One interesting part of the networking and communication setup is aggregation in form of trunking. The task of the aggregation of the transmission lines is to provide availability with divided communication network among more physical transmission lines. If one line exhibits failure, communication is continued on other lines. Aggregation is formulated in the standard IEEE 802.3ad [3], where there is described the compatibility of this solution with different network components from different producers as well.

In the aggregation (Figure 1) the logical MAC address is used that is assignment to more physical ports. This logical address is moved on the third layer, what is input Address Resolution Protocol (ARP). All ports who are in aggregation are in one interface Data Link Provider Interface (DLPI) ports of the router, which looks and behaves as one port and thus the Spanning Tree Protocol (STP) does not block it how a topology loop.

Aggregation must be supported on both sides of the communication channel what is ensured by the protocol Link Aggregation Control Protocol (LACP). Communication is started by the messages of the type “query”, where assigned for aggregation ports on both sides are. That is the way for creating a trunk with a sent message “start group”, where there are the identifying

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lines to ports. The collector compiles the communication from other ports and the distributor separates dataflow between ports in trunk or aggregation group.

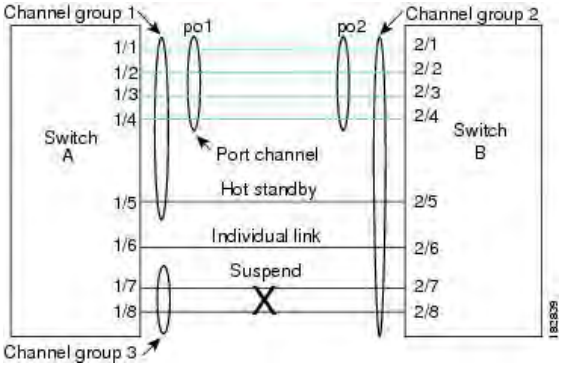

Figure 1 Scheme of transmission lines aggregation (TRUNKING) [4]

2.2 Data and WDM technology

Next part that we want to show for the support of the communication among individual DTCs is technology based on the multiplexing and demultiplexing transmition wavelength via fiber optic cable [5]. In fiber-optic communications, wavelength division multiplexing (WDM) is a technology which multiplexes a number of optical carrier signals onto a single optical fiber by using different wavelengths of a laser radiation. This technique enables bidirectional communications over one strand of the fiber, as well as multiplication of its capacity. The WDM system uses a multiplexer at the transmitter side to combine the signals together and a demultiplexer at the receiver side to split them apart again. With the right type of fiber it is possible to have a device that does both simultaneously, and can function as an optical add-drop multiplexer.

2.2.1 Course WDM

Originally, the term "coarse wavelength division multiplexing" was fairly generic, and meant a number of different things. In general, these things shared the fact that the choice of channel spacings and frequency stability was such that erbium doped fiber amplifiers (EDFAs) could not be utilized. Prior to the relatively recent ITU standardization of the term, one common meaning for coarse WDM meant two (or possibly more) signals multiplexed onto a single fiber, where one signal was in the 1550 nm band, and the other in the 1310 nm band [6].

An interesting and relatively recent development relating coarse WDM is the creation of GBIC and small form factor pluggable (SFP) transceivers utilizing standardized CWDM wavelengths. GBIC and SFP optics allow for something very close to a seamless upgrade in even legacy systems that support SFP interfaces. Thus, a legacy switch system can be easily "converted" to allow wavelength multiplexed transport over a fiber simply by judicious choice of transceiver wavelengths, combined with an inexpensive passive optical multiplexing device.

2.2.2 Dense WDM

Dense wavelength division multiplexing (DWDM) [7] refers originally to optical signals multiplexed within the 1550 nm band so as to leverage the capabilities (and cost) of erbium doped fiber amplifiers (EDFAs), which are effective for wavelengths between approximately 1525–1565 nm (C band), or 1570–1610 nm (L band). EDFAs were originally developed to replace SONET/SDH optical-electrical-optical (OEO) regenerators, which they had made them practically obsolete. EDFAs can amplify any optical signal in their operating range, regardless of the bit rate. In terms of multi-wavelength signals, so long as the EDFA has

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enough pump energy available , it can amplify as many optical signals as can be multiplexed into its amplification band (though signal densities are limited by choice of modulation format). EDFAs therefore allow a single-channel optical link to be upgraded in bit rate by replacing only equipment at both ends of the link, while retaining the existing EDFA or series of EDFAs through a long haul route. Furthermore, single-wavelength links using EDFAs can similarly be upgraded to WDM links at reasonable cost. The EDFA's cost is thus leveraged across as many channels as can be multiplexed into the 1550 nm band.

2.2.3 Load DWDM at Trnava university

Let us show, how is Trnava university using DWDM technology (Figure 2). This communication is set up between two datacenters. The first is situated in Hornopotočná street (the rectorate of the university), the second is in Holleho street (Albertinum center). Among this two individual DTCs is DWDM connected via Small Factor Pluggable (SFP) installed in Cisco Catalist 4507. DWDM using four wavelengths. Two of them are used for the standard communication between DTCs, one is used for phone lines and last one is used for Storage area network (SAN) connection between DTCs. SAN connection is very important, because this allows a higher functionality in virtualization or cloud computing. This higher functionality is in the first place migration of the VMs between ESX servers and datastores in the DTCs.

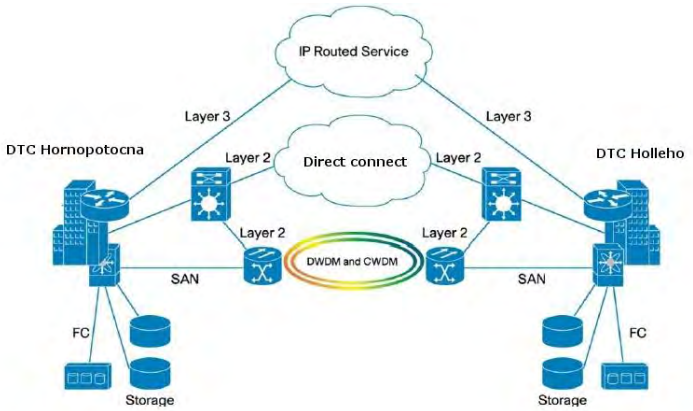

Figure 2 DWDM between DTCs in Trnava university

3 Security on the network

Firstly, it is proper to show schematically the main topology of the Trnava University network. We can start from Figure 3, where is the topology of the Trnava University network. University network is designed with respect to the organization structure of the university. Structure of the network consists of two main parts. The first part is the rectorate part, where is Internet service provider (ISP) connected, DMZ core switch in redundancy mode and firewalls – Cisco ASA and Checkpoint application firewall. The second part of the network is designed for faculties´ communication. Every faculty of the university is equipped with identical component parts designed to cooperate with the rectorate core switch, distribution and access switches in faculties buildings.

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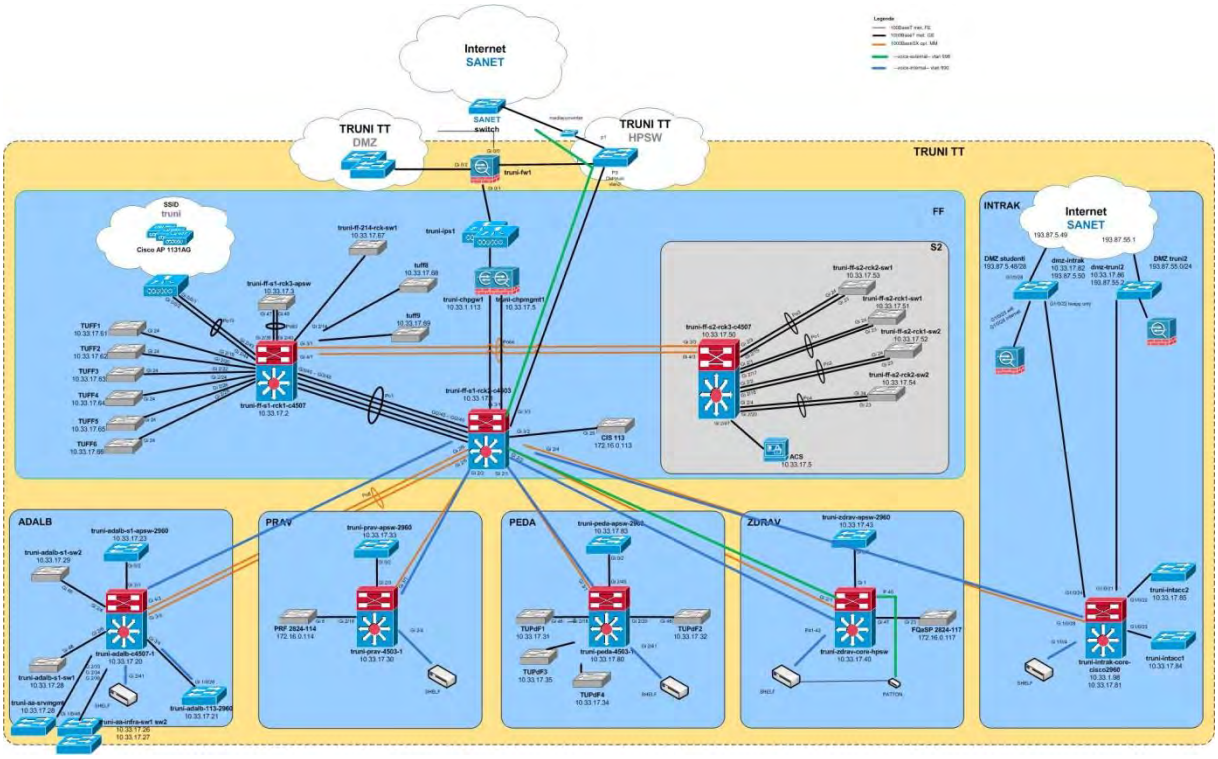

Figure 3 Topology of the Trnava University data communication network

The security of the university network is secured by four layers system. The first layer is the security provided by university's firewall. Cisco ASA is a good firewall choice, which enables to adjust the main security policy, for example blocking input/output communication with server or ports by the primary network antivirus – TrendMicro [8]. The second level, or second firewall rules is load of the application firewall. University using the Checkpoint firewall, for application control on the network. The third level of the security is the access list on the core switch, where route policy for all faculties and buildings is set. The third part of the security is Intrusion Detection System (IDS) [9] system for detecting problems and port security on the network. The last part is the security policy on the distribution switches, where is set the policy for every building and faculty. This is the network security element. On top of this, the university is protected with antivirus in all Windows servers and users end nodes. All networks are designed with VLAN modes for all faculties and primary applications. For example this VLAN is defined for every faculty:

- Sunray – for thin client,
- User – for all users and end nodes,
- Management – for management and monitoring on network,
- Phone – for telephone central,
- Wifi – for APs and clients in the building,
- Elab – for communication of the our experiments with servers in DTCs.

Approximately 90% of the university communication is in crypt mode. Every page, every communication between servers is protected for cybercrime. Connection to the network from outer word, from other providers is just in VPN mode authenticated to IDM system of the university.

4 Redundancy of the connectivity to ISP

Very important part and goal of this work is redundant connectivity to ISP. Trnava university have a primary ISP, like every universities in Slovakia, SANET – Slovak academic network. Old way to Internet is oriented to MTF STU. This line is secured with Cisco ASA firewall on L2, L3 and with Checkpoint firewall on L7.

Next way to Internet is from new building Students hostel on Rybnikova Street. Security from this line is built with Cisco ASA firewall on L2 and L3 layer. Using L3 rules it is possible to manage and route all communication from redundancy to each line.

Primary line is routed on the IP network 193.87.54.0/24 and secondary line is routed on 193.87.55.0/24. Each line is active for primary IP address range and stand-by for the other. This is easy way to rerouting all of communication to one line to ISP.

5 Conclusion

In this contribution we tried to show the communication among DTCs of the Trnava University with all the progressive parts, including virtualized. Our three DTCs are geographically distributed in Trnava town, connected via Fiber optic (FO) . All transmission lines is design to transfer at minimum 1Gbps on one wavelengths λ=1310 or 1550 nm. Between DTCs Hornopotočná a Hollého is used DWDM connection for the separate communication. Under separate communication we mean the connection where different wavelengths for different communication are used. This approach enabled for the connection of the SAN (storage array network) between a both DTCs that is substantial contribution for virtualization, bringing migration among servers or datastores in both DTCs, resulting in many assets, the savings in the first place.

And what is really benefit from this work? Separated line to ISP is very important, because demands on the network connectivity and availability of the organizations are still increased. Lost connectivity for few days can have liquidation proceedings. Every organization, not just university with students and research, must have plan for business continuity and disaster recovery. Without these plans, organizations are still in vulnerable.

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Management of IT environment end users and the impact of new technological solutions

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Abstract
The paper deals with the effects of current technological solutions ensuring and providing IT services and resources to end-users in corporate environments. Current trend of use and mainly of providing access to corporate data and resources from any location changes previously clearly defined working environment and requires defining of new rules of their administration and security. While the management of end-users' desktops is usually realized with a uniform procedure, in case of necessity of expansion the possibilities of access to corporate data are missing, or more precisely, there are not well-defined working rules and the security rules. An important part remains enhancing of the safety awareness of employees as the safety of IT resources and services depends mainly on the way of using. The object of the contribution is providing the information about the way of the management of the IT environment of end-users on the Faculty of Economics and Management of Slovak University of Agriculture in Nitra.

Keywords: *cloud computing, end-user computing, IT security, management IT, Microsoft Deployment Toolkit, mobile computing*

JEL Classification: *C63, M1, O33*

1. Introduction

Implementation of new technological solutions in the field of information and communication technologies (ICT) in all activities of the organization is now necessary and undeniable phenomenon that affects the quality of all internal/external processes of the organization. Last years in ICT have brought several trends that significantly change the traditional IT environment of the organization, are examples of cloud-based solutions, the concept of BYOD (Bring Your Own Device), social networks and related growth of mobile communications. The procedural changes which need to be applied for the introduction of the organization relate not only to the organization itself, but the particular end users. The paper deals with changes in the management of the IT environment at the Faculty of Economics and Management that brought with yourself these technology solutions. In the first part we address oneself to changes in the management of desktop infrastructure. The second part deals with changes in the online IT services (based on SPI model[1]) and changes in the provision of mobile access to corporate data and resources and the resulting changes in IT security.

1.1 ICT organization and the end user

Information infrastructure of the organization is a complicated complex hardware and software resources. Its main task is to provide open access to information to a wide range of users from the internal and external environment of the organization. A key role of the management and operation of the IT infrastructure of the organization is to create a favorable

[1] SPI is an acronym for the most common cloud computing service models, Software as a Service, Platform as a Service and Infrastructure as a Service.

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working environment for the end user. According to Chaffey and Wood (Chaffey & Wood, p. 558) the term end-user computing has traditionally been used to refer to the study of the management issues involved with providing services for non-specialist users of information systems. That is essentially anyone who is not an IT specialist who may be involved in developing or supporting systems. Deployment of new technology solutions is changing the style of its work but mostly its end-user environment. EMC company (Robidoux & Norris, 2014) for the main steps in the transformation and treatment of end-user environment considered:

- Characterize users.
- Create an end-user app catalog.
- Design and build a well-managed architecture.

In heterogeneous IT environment with a lot of end users the full process requires a considerable degree of abstraction. According to Cassano (Cassano, 2014) end-user computing is no longer about managing laptops and desktops. Today, you need to support user access to applications and data services on any device and in any locations (see Figure 1).

Figure 1 Current end-user environment

Source: http://www.unisystems.com/en/news-inside/ekdiloseis/2014/item/504-it-directors-forum-14.html, End-user computing is not a trend, it's a transformational shift, Cassano, A.

2. Characteristics of selected components of an end-user environment at FEM

Information infrastructure of the Faculty of Economics and Management has undergone in recent years changes, that arise from changes of the information infrastructure of the university and they are affected by global developments in ICT. Workplace Centre of Information Technologies (CIT) provides comprehensive infrastructure management and it is the main point of contact for resolving all user requirements and incidents.

2.1 Management of desktop infrastructure

At the Faculty of Economics and Management of Slovak University of Agriculture (SUA) is currently operates an extensive infrastructure of hardware devices - for work on the network is registered approximately 400 PCs and notebooks, 70 thin clients (Oláhová

& Ujlaky, 2015). Stated number of devices represents part of the desktop infrastructure without network hardware such as printers and hardware devices connected through WiFi network. The predominant operating system is Microsoft Windows operating system, especially MS Windows 7 Enterprise MS 64/32 bit versions, in a smaller number occurs Microsoft Windows 8 and Microsoft Windows 10. Operating system Microsoft Windows Server 2012 R2 is used by users working on the thin client. Desktop, in disregard of the type of operating system and hardware, has a standardized end-user environment for the operating system (hostname and workgroup, user accounts), application programs and intranet applications.

As almost half of the terminal equipment is used in the direct teaching process (computer labs) critical factors are PC uptime, operating system stability and minimal preparation time/restore PC. The classical method of installing a new PC was the total preparation time of about three hours. A complete reinstallation of the PC occupies 5-6 hours, which was associated with backup user data and settings specific applications and their resumption after installing the operating system. At a stated number of terminal equipment it is necessary to implement a method of preparing a desktop that allows unattended automated (scripted) installation of the desktop with minimal IT intervention staff and the possibility of remote installation.

First, partially automated method PC installation was at FEM used in the years 2001-2009 and it was based on the image installation of the reference PC. A disadvantage of this method was a significant rigidity (several variants image PC depending on the hardware configuration). In year 2011 was reworked methodology of automated installation PC with using tools of Microsoft Deployment Toolkit (MDT). The main change is in the application of automated installation of PC controlled by using scripts. An administrator uses a console MDT Deployment Workbench which is used to configure the deployment environment. By considerable simplification of the new methodology we can the whole process divide into two basic steps and tasks that were required fulfill:

1. Preparation of the reference PC - manual installation and creation of the image in format WIM (Windows Imaging Format). This image is then imported into the deployment repository.
2. Installation of the MDT tools and configuration of the deployment environment which includes:
    - Creation of the deployment repository, adding resource files OS, OS updates, hardware device drivers and user applications.
    - Creation of a so-called "Response file" - a sequence of tasks to be carried out after initiating an unattended installation of the reference PC.
    - Creation of a so-called deployment point and generate a customized version of Windows PE. This is triggered by preparing PC and initializes automated unattended installation.

The final process of installation of the PC is based on the strategy with minimal intervention of the administrator (Lite Touch Installation, LTI), with a total time of installation and the settings of the PC is about 2 hours, which represents a shortening of the preparation time the PC about 67 percent. It should be emphasized that the used method of preparation is always necessary to modify the introduction of new versions of the OS and application software user requirements to complete a new application. The benefits of automated and scripted installation of the desktops are:

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- The possibility of mass installation with minimal interventions during the installation.
- Uniform environment of desktops and the possibility of remote administration.
- Reduce the time demands and the total cost of administration of the desktop infrastructure. Reduction of time requirements and total cost of ownership (TCO) of desktop administration infrastructure.
- More effective management of desktop infrastructure.

2.2 Cloud solutions Microsoft Office 365

Another solution available to end users is a cloud-based solution of the Office365 from Microsoft. These solutions generally allow the user to gain "independence" from the desktop computer at work because of all the applications and documents can be accessed from anywhere. Cloud technology is emerging as a viable option for companies that want to cut costs, increase agility or augment their own IT resources without building out new infrastructure (Buchanan, 2012).

SUA implemented a cloud-based solution Office 365 in 2013. From the technological point of view is Office365 model of the cloud services type Software as a Service (SaaS) and makes a number of services for all workers and students. A brief survey of the teaching staff FEM showed that pre-deployment Office365 using other cloud-based solutions (Dropbox, Google Drive, iCloud) for private purposes and also in the education process. For user authentication to Office 365 is used the same login details as to the internal information system. The basic services that are currently used by most users FEM include:

- Outlook for e-mail. UIS system of the Slovak University of Agriculture provides users with 300/600 MB of disc space. Email migration to Office 365 user gets a capacity of 25 gigabytes. Another benefit is a more effective way of email filtering and eliminating spam.
- OneDrive for online storage and file sharing, user has to 1 TB of personal storage space. Benefit is the ability to save files to the online storage OneDrive and offline PC. If the user is working offline, after connecting OneDrive updated online version of the changes made offline.
- Online applications of the MS Office 2013.

Despite these advantages, it is clear that the "transition" to a user of this service is slow, according to the information administrator UIS transition to only 175 university staff. The principal objections that users mentioned in the survey include:

- Possible access to services (on loss of Internet connection).
- Less flexibility in need of treatment services, such as configuration and customization email box according to your own requirements.
- Issues related to the protection of personal data and files stored on servers outside perimeter of the university network and the fear of the loss, respectively misuse.

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2.3 Wireless WiFi network and users mobility

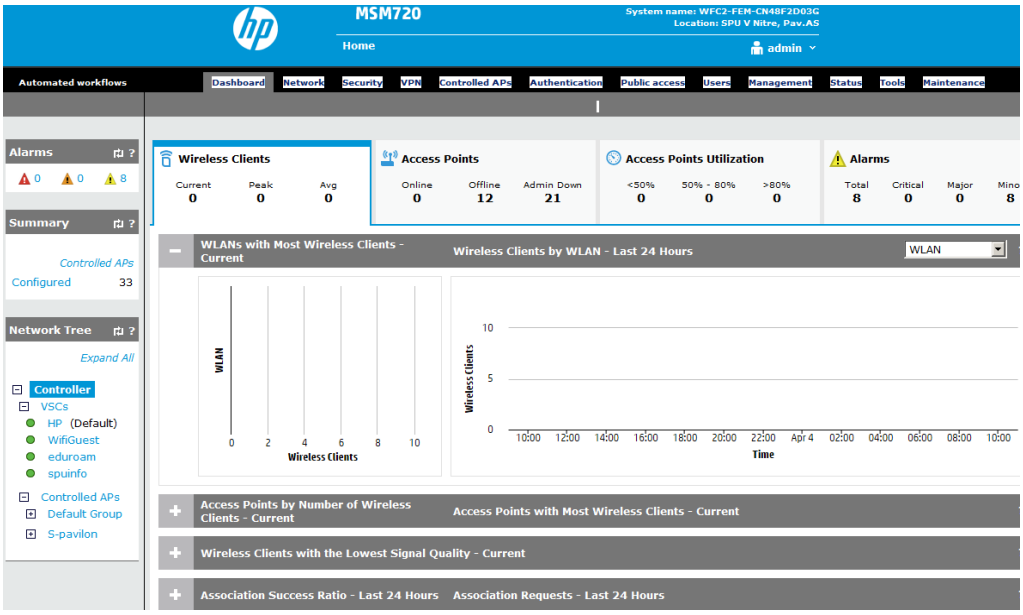
The first solution of the wireless Wi-Fi network has been to FEM implemented in year 2006. Hardware infrastructure consisted access points Cisco and for network management and end-users approach was used by the RADIUS server. Lack of the network was small of availability, as the network covers only part of the faculty premises and the low bit rate. User access requires registration of a WiFi card and then entering the password. After year 2010, management of the WiFi network came under the central institutes. For end-users is made available to the following networks:

- Network spuinfo with free access to intranet web site of the university.
- Network eduroam is designed for employees/students and requires user authentication and allows access to the intranet and Internet.
- Network WifiGuest is for external guests SUA (conference participants).

In 2015 was the original hardware platform of the WiFi network modified and extended to include installations of HP company (MSM Controllers, Access Points) for centralized management. Changes touched also underlying network infrastructure, where multiple switches are replaced by a switch with PoE (Power over Ethernet), allowing the expansion of network availability to areas where there is no electricity available. For end users, these changes WiFi network had the following benefits:

- Extending opportunities for mobile internet access/Internet.
- Available networks throughout the faculty building (in sum 22 access points).
- Increasing the transmission speed network to 300 Mbps (formerly 54 Mbps).
- The possibility of automatic roaming between access points when moving within the building.
- Increasing the safety of WiFi network because HP equipment in addition to conventional security mechanisms used intrusion detection system (IDS) and built-in firewall to filter access to network services.
- In terms of network administrator the benefit is a tool for remote configuration and management which is available through a secure web browser (Figure 2).

Figure 2



Source: own processing

3. Conclusion

The end-user of information infrastructure of organization uses in their work not only PC/notebook, but increasingly also mobile devices type of BYOD New technological solutions put the right to supplement his knowledge and adaptation. Unless the transition to these solutions is not compulsory, but founded on a voluntary basis, these solutions by end-users ignored and unused. Therefore one of the key tasks of the IT department within an organization remains the support of users, their further education (in the form of lectures and workshops). Mobile user access and use of cloud services, blurring the boundaries between work and personal data or files stored on those premises, which requires education of end-users and IT security issues.

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Influence mobile devices to the educational process

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Abstract
Mobile devices definitely belong to new learning technologies that offer great scope for learning. The rapid development of information and communication technologies and globalization itself also contributed to significant changes in the learning process. The traditional paradigm, procedures, methods that have been used for centuries, of course, they are no longer sufficient in such a large exponential growth of information. Requirements to improve the efficiency of the educational process has increased significantly. The main content of this paper is to clarify the impact of mobile devices on the educational process.

Key words: *e-learning, generation Z, mobile learning, mobile app*

JEL: *M30*

1. Introduction

Mobile Learning (m-Learning) is a revolution in e-Learning.

Throughout history, new technology has brought about revolutions—the Agricultural Revolution, the First and Second Industrial Revolution, the Modern Revolution and the Digital Revolution are some examples. Is m-Learning going to spark the next educational revolution?

While educators have been busy trying to understand and teach to Millennials and Generation Y over the past several years, a new generation of mobile natives has been growing in the background. Generation Z, which includes those born after 1995, now fills our K-12 classrooms, and they've brought their mobile habits with them. The Growing and Learning with Mobile Infographic will give you a better understanding of the Generation Z students, including the role mobile devices play in their home and school lives.

2. Mobile Trends around the World

Studies show that, by the year 2017, the percentage of smartphone users in the US will reach 80 percent – triple the percentage of users we saw in 2011. In the UK, this number is set to reach slightly more than 80 percent, while in China and India, the percentages are set to rise at a slower rate. Globally, mobile learning is growing at a rate of 18.2 percent per year, suggesting that learning organizations will need to adopt appropriate technologies in order to keep up with growing demand.

2.1 Mobile in the Classroom

Today's middle scholars use mobile devices for everything from checking grades to writing papers. Of those students using mobile devices:

- 78% use devices to check grades
- 69% to take notes

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- 56% to access text books
- 64% to write papers
- Teachers are also on the move, with 45% using a tablet or e-reader in class in 2014, up 20% from 2013.

2.2 Impact on Student Achievement

Studies show that standardized test results are higher in classes where students have access to mobile devices. In one case, test scores of low-income students climbed as much as 30 percent after being given access to smartphones – an increase attributed to the fact that students were able to keep connected with teachers and classmates, even while at home.

Mobile learning is a hot topic right now, with great expectations from advocates that mobile devices could transform education, engage students and personalize learning. The reality is a more nuanced—and less homogenous—story.

How parents perceive the value of mobile devices, how they see their children actually using family-owned mobiles for productive (and not so productive) purposes, and what parents think of the possibilities, is a tale of both abundant potential and missed opportunities for mobile learning

The What Parents Think About Mobile Devices for Learning Infographic highlights the perceptions of parents of a mobile generation, from preschoolers through high school-age students. Given schools' increasing interest in engaging students with mobile learning—during and beyond the school day—and in "bring your own device" (BYOD) models, parents more than ever could be key partners in contributing to this new frontier in learning. Parent perceptions matter. Their support and influence can smooth the way for educational technology in schools and help overcome the limitations of school coffers, without which digital initiatives can stall

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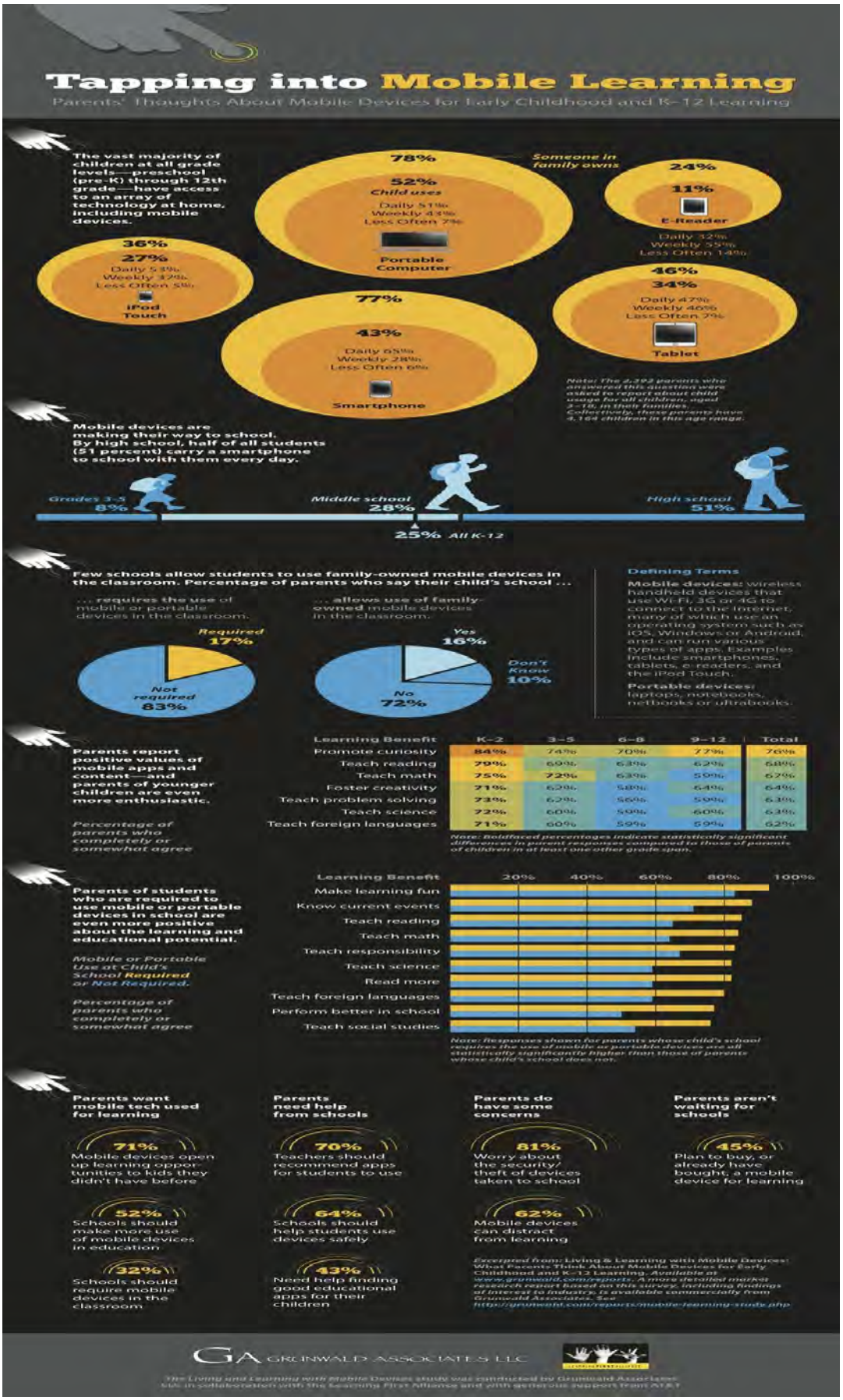
Picture1: The What Parents Think About Mobile Devices for Learning



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3. How m-Learning is Changing the Future of e-Learning

3.1 The ubiquitous nature of mobile devices is beneficial for those interested in m-Learning.

Learners and educators have much to gain from m-Learning. Lesson plans are no longer based around textbook exercises or "Next" button driven online courses. Instead, mobile learning breaks you free from your desk! You can access resources anywhere, anytime. With apps like CourseMill® Mobile, learners can even download courses and files to your phone for offline study as well. Conveniently accessible m-Learning materials provide ideal performance support, just-in-time learning and lead to innovations like augmented reality.

3.2 Augmented Reality and m-Learning

It might sound like something out of the Matrix or Star Trek, but augmented reality technology can make learning more interactive and enriching. What exactly is it? The simple definition is: a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. For a real-world example, let's look at the 2014 IKEA catalog and its accompanying app.

After launching the IKEA Catalog app, you use your smartphone or tablet camera to zoom in on an orange cross at the bottom right of certain product pages. An icon then appears on the device display, allowing you to access the augmented reality features. You close the catalog and place it wherever you're considering new furniture in your room.

The app uses the size of this physical, real-world IKEA catalog to come up with the approximate dimensions of the virtual furniture that is about to appear on screen. You can rotate, reposition and manipulate that image until you think the furniture or decor looks just right, before confirming the selection from a scrollable list. Finally, a virtual version of the new sofa, desk or bookcase with your room in the background is shown onscreen—allowing you to visualize how your new furniture will work and make sure it will fit in your room!

Picking out furniture isn't quite the same as taking an e-Learning course, but imagine the possibilities for learning! You could put triggers (images that activate media when scanned by an augmented reality-enabled device) all around your work space so that when employees scan them, they can quickly access information about that object or space. For example:

- Doctors in training could use their mobile phones to view videos demonstrating the proper usage of different surgical tools or overlay a digital image of a patient's X-rays onto a mannequin for added realism.
- Mechanics in training could use augmented reality to watch video of a repair process for any part of a vehicle just by pointing their phone at that part.
- Scientists in a lab could quickly learn safety procedures and protocols for working with the different equipment.

From augmented reality to anywhere, anytime learning, m-Learning is the wave of the future. Are you ready to develop mobile-friendly learning? It's easy when you use an authoring tool like Lectora® Inspire.

4. How to Create a Successful Mobile Learning Strategy

More and more learners are using their mobile phones and tablets to get information when and where they need it. Regardless of whether they are in the middle of a crowded office or in a doctor's waiting room, today they have the power to access knowledge when it is most

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convenient for them, thanks to **mobile learning**. In this article I'll shed some light on the secrets behind developing a mobile learning strategy that is on target and offers your audience a memorable and compelling mobile learning experience.

1. **Learn as much as possible about who your learners are.**

   The key to creating a successful mobile learning strategy is knowing as much as possible about whom you are designing for. Does your **audience** already use their mobile devices on a regular basis? What information do they already have, and what do they need to take away from the mobile learning experience? Are they ready and willing to use their mobile device to access mobile learning courses, or are they still a bit hesitant? You need to know what they expect from the mobile learning course, where they will be accessing it, and how much time they can devote to the experience. You can learn more about your learners through online **surveys**, **focus groups**, and interviews.

2. **Repurpose your existing eLearning content to make it mobile friendly.**

   The content you currently have in your eLearning course cannot be directly imported into your mobile learning course. It can, however, be modified in order to seamlessly integrate into your mobile learning strategy. You can **repurpose the eLearning content** you already have to make it effective for **mobile training**, so that your learners can get the information and skill set development they need when they need it. For mobile learning courses, it is best to keep the content as digestible as possible. You'll have to keep in mind that your learners are going to be accessing the mobile learning course on the go, meaning they won't have an abundance of time to sit down and participate in a 30 minute module. Break lengthy text blocks into bullet points, and highlight key ideas with bold or colored **fonts**.

3. **Remember that you are dealing with a distracted audience.**

   Virtually all learners are distracted to some degree. Even those who are taking traditional online courses may have their mind on other things while they are participating. However, you have to remember that mobile learners are going to be accessing your mobile learning course wherever, whenever. As such, they are going to be dealing with a myriad of **distractions** while they are trying to absorb information. This is why it is crucial to create engaging, information-packed, and powerful content. You have to grab their attention from the very beginning, and hold it by providing them with key pieces of knowledge they need to receive real world benefits.

4. **Learners may be rushed, but the design should not be.**

   Your learners are only going to have a few minutes, on average, to access your mobile learning course. More often than not they are going to be rushed, therefore they need to get as much information as possible as quickly as possible. However, this does not mean that the **mobile learning design** and development process should be rushed as well. This will simply diminish the quality and the **effectiveness of the mobile learning course.** There is a way to cut down on **development time** while still offering your learners a valuable mobile learning course. You can create templates to reuse for your mobile learning courses, wherein you can change the content and **multimedia elements** in a pre-made layout.

5. **Use tracking data to fine tune the mobile learning experience.**

   By using a mobile learning tool that is compliant with SCORM (Sharable Content Object Reference Model), you can track learner activity in order to determine what is

working and what may need to be fine tuned. For example, if you discover that only a small percentage of your learners are able to complete one of the mobile-friendly modules you've created, then it may be time to assess the difficulty level. On the other hand, if one of your mobile learning courses is faring well, maybe you should consider following up with supplemental content that explores additional aspects of the same topic. This will help you to design mobile learning courses that are relevant and valuable, rather than focusing your time and attention on those that may not be as useful to your audience.

6. **Don't force mobile learning upon your audience.**

   Unfortunately, not all of your learners are going to be ready and willing to try the mobile learning experience. There may be some who prefer to stick with traditional eLearning and are going to be resistant to your **mobile learning strategy**. It is important not to force it upon your learners, or else they simply won't be **motivated** to learn. Instead, ease them into the mobile learning experience. Encourage them to complete supplemental mobile learning courses that will expand their comprehension, so that they can see, firsthand, how a mobile learning course might benefit them. If you find that a majority of your learners aren't using the mobile learning tools you've developed, then it may be time to do additional **audience research**, or get their **feedback** to find the reasons behind their resistance to mobile learning.

Use these tips to create a successful mobile learning strategy that will help you design mobile learning courses that always hit the mark.

5. Conclusion

Thanks to the growing popularity of mobile devices in recent years, more and more learners are now turning to their tablets and smartphones to develop their skill sets and absorb invaluable knowledge on a daily. In this article I shared several ways that can help you boost the effectiveness of your mobile learning course. The simple truth is that learners today are used to accessing information when and where they need it. Their mobile devices give them the ability to explore new ideas or expand their educational horizons in a matter of seconds. In other words, a mobile learning experience is effective simply because it gives learners the opportunity to learn anytime, anywhere, without limitations. M-learning - this is a new way of e-learning.

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Overcoming barriers to efficient farm management: the role of knowledge and information management in the rural advisory sector

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Abstract
This study was conducted among agricultural advisors employed in both the public agricultural advisory centres as well as in private consulting firms. The aim of the study was to analyse and evaluate the importance of knowledge and information in the problem solving process of clients receiving advice. In the study, the following objectives were identified: analysis of the source of knowledge and information, assessment of the impact of agricultural information and knowledge system on the farm efficiency and development. The study involved 3,921 agricultural advisors based in Poland. The research sample elicited 475 detailed responses. Hence, information obtained during the study may provide a solid basis to reach general inferences. An analysis of the data elicits the conclusion that knowledge and information management are essential tools in the process of providing advice to clients, for the problem solving process, and therefore in making the best decisions. The modern economy is based on knowledge. This applies equally to the agribusiness. Knowledge management in this sector differs from this type of processes in other departments and sectors of the national economy due to the nature of agriculture. However, the significance of these processes is increasing and now it`s also an important part of management in agribusiness.

Key words: *advisory, farm management, knowledge system, information*

JEL Classification: *Q13, Q16*

1. Introduction

Knowledge and information are the most important factors to economic growth and development. To a large extent, they determine the competitiveness of an organization in every part of the national economy. These are valuable resources of an organization, inherent in the people (employees, members of the organization) [Gamble, Blackwell 2001]. The management of this resource is based not only on the problem of acquisition and ownership of knowledge, but above all on the knowledge of the methods of obtaining it and the ability to achieve the objectives [Kłak 2010]. According to Kisielnicki [2004], knowledge is an "intangible resource of an organization related to human activity and referring to data, information, procedures, experience and education". Raw data is turned into information once it is ranked and classified, and then transforms into knowledge where it can be used to solve problems or to gain a competitive advantage. For Drucker [1995], skilful use of knowledge means reducing "the gap between available resources of knowledge - and the knowledge needed to make a decision". Drucker emphasizes the practical dimension of knowledge management. Wawrzyniak [2001] stated that "the main problem in terms of knowledge management is not its acquisition and collection, but the application into practice".

Knowledge is the processed equivalent of information, available for practical use. Information has a quantitative character, whereas knowledge is qualitative and intangible in form, but also verifiable in practice, e.g. in effective management. According to Skrzypek [2011] knowledge is used and applied by man and is the source of human competence and efficiency. It is also a driving force for creating new solutions and implementing innovation in organizations.

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Today, much study is devoted to knowledge and information management in the theory of organization and management, especially in the content of training organizations and across the knowledge-based economy. The importance of knowledge within human resources – which one of an organization's most valuable resource - is well understood nowadays. Information is viewed as a major production factor in terms of current organizational and management theory, and it relates to technical and organizational progress [Grudzewski, Hejduk 2007].

Knowledge management in organizations is a continuous process consisting of several stages. Among these are: searching for information, creating knowledge, accumulating knowledge and information, developing knowledge and transmitting knowledge. This is especially relevant in the rural economy advisory process. This paper examines the process of cooperation between agricultural advisors in Poland with their clients in the context of the transfer and development of knowledge. The Polish agricultural advisory system consists of boards financed from the State budget, namely: the Agricultural Advisory Centre (employing approximately 90 advisors), provincial advisory centers (almost 4,000 advisors), and the Agricultural Chambers (around 130 employees, including advisors). The system also includes private companies - among them what are known as accredited private entities operators, which may participate in the Rural Development Programme subject to accreditation from the Ministry of Agriculture. The current list of accredited bodies numbers about 170 private advisory companies, operating in both farming and forestry [www.mrirw.gov.pl, www.cdr.gov.pl]. Other than these accredited companies, a variety of private consulting firms, foundations, and associations operate, each providing some form of advisory service.

In general, it is apparent that one of the most important quality control factors for these aforementioned bodies and organizations are the staff and their competencies. It is necessary to identify features that determine the level of the competency skills for advisors. These are taken to be their respective qualifications, professional experience and interpersonal skills. On the basis of his research conducted among employees of provincial advisory centers, Parzonko [2012] states that the advisor is a qualified person "usually having (undertaken) a higher agricultural course, with extra-curricular competencies as required by their prospective employer, such as methodical, communication or organizational skills,, that he/she obtains in the process of training (e.g. post-graduate courses) and vocational training (courses and continuing professional development seminars)".

According to Maziarz's definition (1984), the term advisor means "transmitting adequate information to customers and ensuring or encouraging them to work towards improving the farm organization". A more modern definition of advisor takes a slightly different approach, tailored to the need of present-day clients. However, the starting point is still concerned with the use of information and the transfer of knowledge as a precursor to enable clients to make the best decisions [Kiełbasa, Kania 2014].

Currently, a key role is given to the "Participation methods" in the advisory process. This paper focuses on these methods – in the context of cooperation between advisors and their clients. The "Participation method" allows the advisor and the client to gain a synergy effect from the advisory process. From this perspective, the cumulative effect is that better results are obtained by combining the knowledge of farmer and the advisor. It is then possible to replicate the effect through an individual action. According to Kisielnicki [2004], the conditions necessary for this synergy effect are: the appropriate knowledge resources, good quality and reliable information, access to facilities, and both the acquisition and transfer of knowledge and information. Therefore, it is important to have access to the sources of knowledge and information, as well as the cost of obtaining the data. An appropriate method for selecting information channels is also very important, or (where this is lacking) the ability to construct them [Parzonko 2012].

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This paper refers to the sphere of agribusiness and farm management. There are specific types of entities and organizations in the agribusiness, in which management functions take on slightly different aspects than in other economic organizations [Nowakowska-Grunt, Skowron-Grabowska 1998]. These differences should be taken into account in the analysis of knowledge management processes. However, it doesn`t change the fact that knowledge and information are consistently cited as key factors in achieving a competitive advantage, able to improve competitiveness and overcome the barriers to development and expansion [Kiełbasa 2012]. Organizations operating in the sphere of agribusiness face specific barriers, which are primarily the result of natural conditions. There are also barriers arising as a result of small-scale production, lack of funds for investment or capital accumulation, low income from agricultural activities, poor technical equipment, or lack of access to the knowledge and information resources, etc.[Sulewski 2008]. Despite significant differences, farms and organizations operating in the agribusiness sector are subject to the same economic conditions offered in a free and competitive market, alongside organizations operating in other sectors [Firlej 2008]. In an era where business leadership is so reliant on knowledge, knowledge and information management takes on an added importance in searching for new solutions and implementing innovations.

2. Data and Methods

This study was conducted using the opinion survey method, which is used for descriptive, explanatory or exploratory purposes. These methods provide easy access to the research sample. The purpose of this kind of survey is to take a representative sample and build up a wider picture of the attitudes and opinions of a larger population. The random selection method allows us to extrapolate the results and predict wider patterns [Babbie 2016].

To obtain data, a questionnaire was devised and sent to all the advisors on the accredited list, managed by the Agricultural Advisory Centre in Brwinow [www.cdr.gov.pl]. In total, the list contains 3,921 registered agricultural advisors, forestry advisors, agro-environmental specialists, and nature experts. The results of this empirical research was that 475 detailed responses were received, representing 12.1% of the total study group.

The results were analysed using the induction, deduction and comparison methods. Also simple methods of descriptive statistics were used, as well as ranking analysis of the selected topics.

The objective was to determine how knowledge and information impact on the advisory process and improve management efficiency. Specific objectives were to analyze the sources of knowledge and information of the respondents (advisors and experts) and evaluate selected elements of the system of knowledge and agricultural information. This paper also addresses the impact of information and knowledge on the farm development, and the evaluation of cooperation between advisors and their clients in this field. The responses represent the opinions of agricultural and forestry advisors, as well as the nature experts, and provide a base for an informed assessment of the chosen topics.

3. Results and Discussion

There were 475 agricultural and forestry advisors, nature and agro-environmental specialists in the sample, both from public and private consulting companies in Poland. The selection was random, based on the list of advisors [www.cdr.gov.pl], which is freely available to farmers and entrepreneurs.

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The most important issue from the author`s perspective was the need to test the extent to which knowledge and information is a "work tool" for the advisor. The author was concerned with methods of farm organization and management, and in particular how knowledge assists in optimizing the decision-making process.

All respondents in the sample had undertaken higher education (63.3% in agricultural faculties). Those who didn`t have an undergraduate agricultural qualification had completed training or post-graduate studies. The responses demonstrate that the advisors are more likely to acquire additional knowledge from the Internet, to complement or extend skills. Almost all respondents took part in various training activities, which allowed them to supplement their knowledge, or to obtain current information to solve client problems that were new or unfamiliar. Hence, the effectiveness and usefulness of this online source of knowledge was assessed as the best by the advisors (Table 1).

Table 1: The effectiveness of selected sources of knowledge in the opinion of respondents (n = 475)

Sources of knowledge	Ranking	Number of responses (N)	Dominant (D)	Average rating ($\bar{x}$)
Internet	1	452	1	1.59
Training	2	459	1	1.73
Other*	3	50	1	2.26
Newspapers and magazines	4	403	2	2.35
Literature and handbooks	5	339	3	3.11
Post-graduate studies	6	228	3	3.65

Source: own resource

*) respondents were able to add additional information

The advisors also listed other ways of learning and complementing their knowledge. There were meetings with other advisors in the country or abroad, discussions with clients, meetings with researchers and employees of the research institutes, as well as conferences and seminars, briefings on regulations and legislation, and TV (programmes for farmers). Respondents made use of trade publications, but rarely searched through academic literature. Given the number of respondents it is noted that a relatively large group of advisors graduated from post-graduated studies in different fields and use acquired knowledge in practice (Table 1).

Figure 1 shows the assessment of the selected methods of knowledge acquisition, taking into account the frequency of their use by the respondents. Selected knowledge sources were evaluated by the advisors on a scale of 1 to 6, where 1 is the most frequently used source, and 6 – sporadically or not at all (Fig. 1).

For level 1, the source of knowledge that the respondents use most often, were: the Internet and training. Respondents were free to indicate alternative answers, which they added to the questionnaire. The advisors reported that they rarely derived useful knowledge from sources such as handbooks or materials from post-graduate studies (Fig. 1). Frequency of use was lower (Fig. 1), due to the nature of this method of supplementing knowledge and the higher costs of access (i.e. fees for participation in post-graduate studies).

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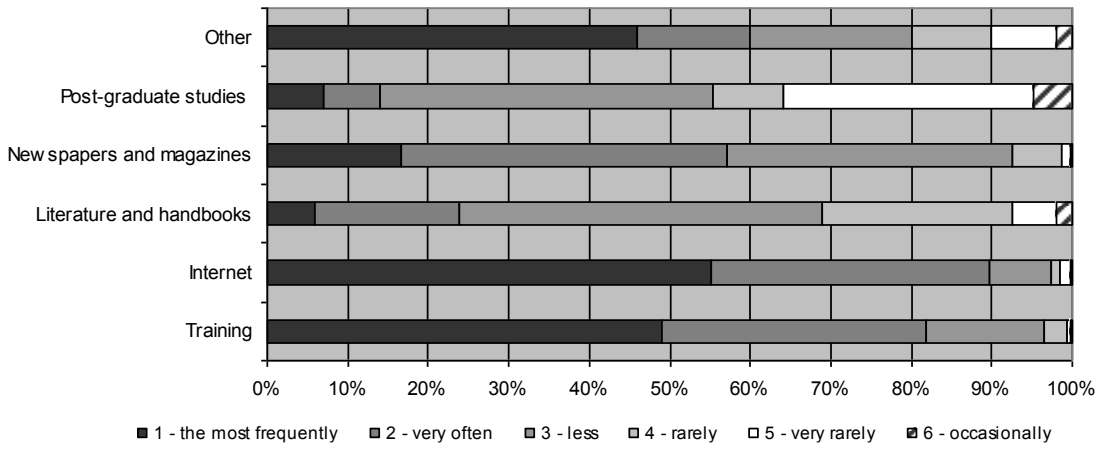

Figure 1. An evaluation of selected sources of knowledge by frequency of use by respondents (n = 475)

Source: own resource

In terms of the sources of useful information offered by those providing advisory services to clients, the respondents were invited to assess the following options: training, the Internet, agricultural magazines, scientific papers, information gleaned from colleagues, friends and family (Table 2). Some respondents also gave other sources of up-to-date information that they often use, e.g. information from clients, explanatory text of legislation, information from government agencies, academic institutions or public conferences, trade shows and fairs, universities and research institutes, as well as companies providing products and equipment. The advisors ranked options in terms of the frequency of use, as well as the quality of information. This made it possible to develop a league table of the most frequently used sources of information which, in the opinion of respondents, is most useful in solving their clients'problems.

The ranking of these sources of information is similar to the ranking of sources from which knowledge is drawn. According to the respondents, the most important source for obtaining up-to-date and useful information to improve the quality of advisory services was training. The Internet is in second place, followed by as agricultural publications and "other sources" as volunteered by the advisors (Table 2).

Table 2: The effectiveness of selected sources of information according to the respondents (n = 475)

Sources of information	Ranking	Number of responses (N)	Dominant (D)	Average rating ($\bar{x}$)
Training	1	449	1	1.60
Internet	2	441	1	1.68
Newspapers/magazines	3	396	2	2.43
Other*	4	32	1	2.47
Colleagues	5	376	2	2.68
Scientific papers	6	331	3	3.09
Friends and family	7	246	3	4.16

Source: ownre source

*) respondents were invited to suggest alternatives

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Figure 2 shows the results of the evaluation of selected sources of information in terms of frequency of their use at work. It is noted that more than 60% of respondents highlighted training as a source of up-to-date information required for professional advisory purposes (Fig. 2). Half of the respondents update their knowledge bank using the Internet (websites, email, social networking, etc.). In terms for locating current market data, agricultural trade magazines were important to one in five respondents. Only 10% cited scientific or semi-scientific papers and research studies published by universities or research institutes (Fig. 2).

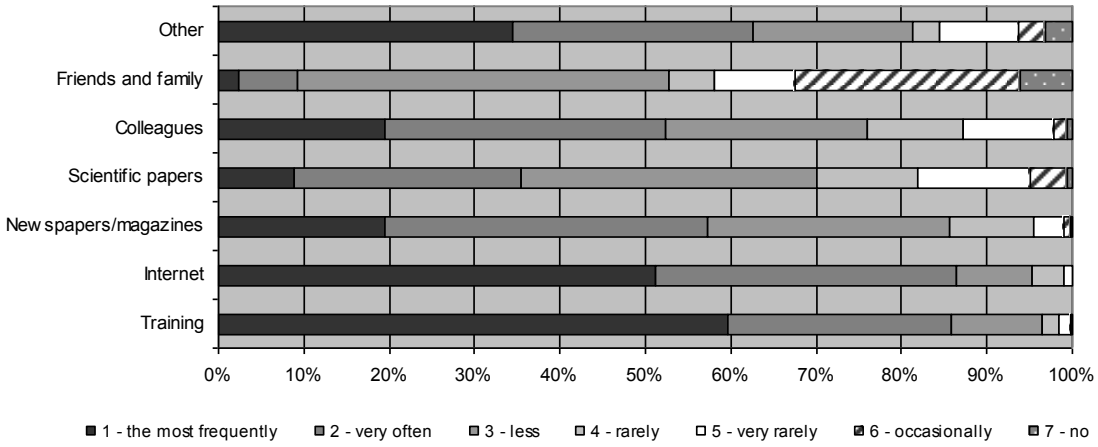

Figure 2. An evaluation of various sources of up-to-date information in terms of the frequency of use by respondents (n = 475)

Source: own resource

For next stage of the survey, respondents were invited to evaluate the providers of agricultural knowledge and information. The following bodies were taken listed: agricultural universities, research institutes, public advisory institutions and the (public) Agricultural Advisory Centre, as well as private advisory bodies, consultancy companies and companies providing advisory services of some description. Table 3 shows a league table of these selected sources of knowledge and agricultural information, together with the number of 'votes' and a weighted average score based on the assessments offered by the respondents. The results are shown graphically in Figure 2 (above)

Table 3: Ranking of selected institutions/organizations in the provision of knowledge and information services to farm managers (n = 475)

Source of knowledge	Ranking	Number of responses (N)	Dominant (D)	Average rating ($\bar{x}$)
Public advisory institutions	1	444	1	1.73
Agricultural Advisory Centre	2	422	2	2.11
Research institutes	3	405	2	2.17
Universities	4	396	2	2.31
Companies providing advisory services	5	315	3	3.19
Private consultancy companies	6	326	3	3.52

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Source: own resource

According to the respondents, the most important institution providing knowledge and information is the public advisory institutions, which are local government units providing services for farmers and rural inhabitants. In second place is the Agricultural Advisory Centre - a body dealing, among others, with the training of agricultural advisors, experts, teachers of agricultural schools, etc. Also, research institutes and universities play an important role in the transfer of knowledge and information.

Figure 2 shows the assessment relating to the role of those institutions and organisations in the process of the transfer of knowledge and information. The advisors assessed the six institutions/organizations on a six-level scale (1 - 6), where 1 is the most important link, and 6 the least. Public agricultural advisory offices were identified as the most important sources of knowledge and information (53%), as well as the Agricultural Advisory Centre (33%) and research institutions (31%) (Fig. 2).

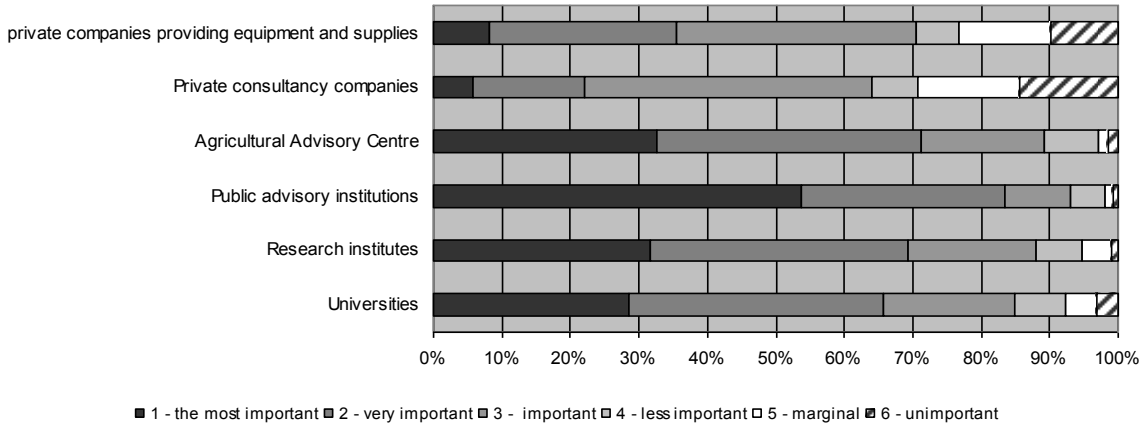

Figure 3. Respondents' assessment of the part played by sources of knowledge and information regarding farm management (n = 475)

Source: own resource

In the opinion of the advisors, neither private advisory institutions engaged in agriculture and rural development, nor private companies providing equipment and supplies, play a significant role in the development of knowledge and information systems in agriculture. Almost 35% of respondents considered private advisory institutions to be less important to sharing knowledge and information with farmers and rural inhabitants. Similarly, 30% acknowledged the importance of private companies selling equipment and providing other production items (fertilizers, pesticides, etc.) (Fig. 3).

The advisors also evaluated the impact of knowledge and information which they provide in terms of farm development. Almost 90% of respondents scored the impact as 'very large' or 'large' (Fig. 4). Only one in ten considered there to be no association between knowledge delivered to clients and farm management efficiency improvements on the part of their clients.

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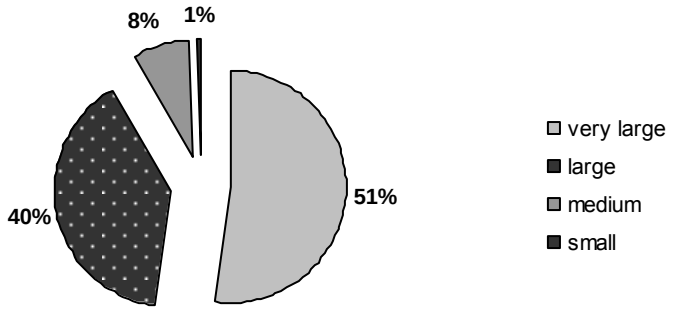

Figure 4. An assessment by respondents of the impact of knowledge and information to farm management efficiency (n = 475)

Source: own resource

The degree of cooperation between advisors and their clients very often takes what is termed as the participation form. This approach assumes a link between the advisor's knowledge and that of the farmer (client). The idea behind such an approach in the process of advising a client is to add value by combining more theoretical with practical knowledge, in order to achieve the best solution. In the majority of cases (Fig. 5) it is assumed that the level of cooperation between respondents and farmers is reflected in the degree of mutual trust, understanding and confidence that the advice will solve the problem effectively and that it is the best available advice. According to the respondents, farmers usually (but not always) supply all the necessary information and participate in the problem solving process. In the sample, only 16% of advisors (Fig. 5) stated that they were sure that farmers had always provided all the necessary data and had fully participated in the problem solving process.

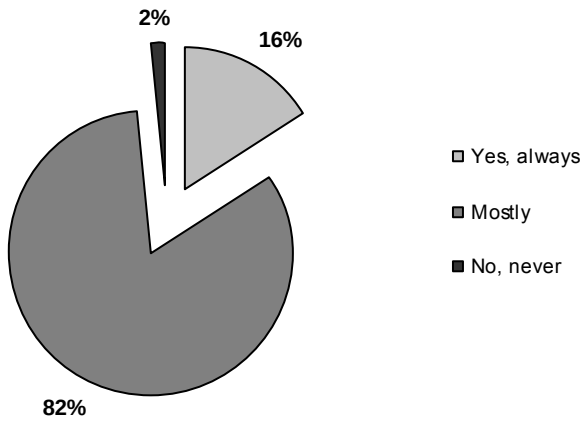

Figure 4. Advisors' assessment of the level of farmer participation in the process of knowledge development

Source: own resource

Among the respondents were also people who indicted that farmers never provide all the necessary data, due to a lack of knowledge in this area, lack of accord between the advisor and client or a desire to conceal (disguise) certain information. In such situations, there is a threat of information gap, which significantly hinders the process of problem solving. Information gaps occur due to the difference between information possessed and information required to

solve a given problem. The more complex a problem, the greater is the prospect of information gap. A lack of cooperation in the context of combining knowledge and information raises questions over the rationality of any decisions taken.

4. Conclusion

On the basis of the survey, it is apparent that the development of better (more optimal) solutions for clients is highly reliant on the possession of reliable and up-to-date knowledge and information. The analysis of the sources of knowledge showed that advisors usually complement their knowledge through participation in training, and frequently search the Internet to update their knowledge bank. Considering the Internet as a primary source of information, advisors should be aware that the quality of information on the network can be suspect or misleading. The quality of information is not only dependent on time factors, but also on credibility of sources. The high degree of Internet use is most likely due to ease and speed of access.

On the other hand, taking into account the institutions and organizations as a source of knowledge, the highest rated were public advisory offices and the Agricultural Advisory Centre as sources of knowledge and information generation and transmission. In the sample, the majority of respondents reported a level of cooperation with public advisory offices and the Agricultural Advisory Centre, so therefore it is unsurprising that those two organizations were highly rated. Public advisory institutions are, in the opinion of respondents, reliable and objective sources of information, as opposed to private bodies (particularly those keen to sell services and goods).

Respondents were aware of the importance of knowledge and information in the process of organization and management. Having the knowledge and good quality information allows the client to achieve an economic advantage and become more competitive. Respondents noted the impact of transferred knowledge and information on the fortunes of the agricultural enterprise and client businesses. Furthermore, client participation in the process of knowledge and information transfer was regarded with great importance. The combination of the advisor knowledge bank and of information gleaned from clients may determine the success of the Polish advisory system, through what is term as the synergy. In cases where reliable information is absent, there is a risk of information gap which is likely to impede the implementation of a best-scenario solution to a client's problem.

The research has enabled the author to draw the following conclusions:

1. The Internet, which was most often used by the advisors operating in the sphere of agribusiness in order to update information, is not always reliable as a source of quality information. When using this source of information, it is necessary to apply relevant criteria in order to filter through the results. Using the Internet as a primary source is also dependant on the degree to which the advisor is familiar with the given problem, and with the client's expectations.
2. Public advisory institutions play an important role in the agricultural knowledge and information management and transmission system. It is regarded by both advisors and clients to be a reliable and objective source of information. Advisors and clients also assess the agricultural advisory bodies as making an important contribution to raising the knowledge bank of farmers and rural inhabitants. Considering this, the activities of public advisory bodies should be supported and developed, for example into new areas of agribusiness, organization and management.

3. Knowledge and information are important factors affecting the quality of advisory services. Appropriate levels of knowledge and advisors having access to reliable information improves the quality of those advisory services and best informs client actions and decisions. This allows them to overcome barriers to efficient farming and organizational management. Furthermore, possession of the appropriate level of knowledge and up-to-date information influences strategic decision-making in the field of the development of today's agribusiness. Therefore, it is clear that a process of synergy is taking place – the long-term benefit of combining the advisor's knowledge bank with the practical experience of the farmer.

Acknowledgements

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SESSION 10

Food marketing and consumer studies – organized session within FOODCOST international workshop *„Bridging traditions with novelties“*

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The market of milk and dairy products in Russia: peculiarities, tendencies and prospects of development

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Abstract
The dairy industry is of particular importance for the economy and population of Russia. In the dairy industry and related industries employs more than 21 thousand organizations and more than 1.2 million people, milk and dairy products to 15% of the turnover of retail trade networks.
In the 90 years the production of milk and dairy products is characterized by significant decrease of production and by 1999, the decrease amounted to 45,16%. The result of research of market of milk and dairy products: production declined faster than consumption of milk and dairy products.
In 1990, per capita consumption of milk and dairy products was 370 kg per year, in 2014 this figure was only equal to 243 kg. The decrease in consumption of milk and dairy products is a result of lower real incomes.
Constant excess consumption of milk and dairy products on total volume of production over a long period of time led to the growth of imports. The volume of imports in the period between 1990 and 2014 has increased by 11.84%, while in 2014 the volume of imports decreased by 3% compared to 2013.
The sanctions imposed in August 2014, could not ensure rapid growth of production volumes of milk and dairy products in the country.
The main reasons for low production of milk and dairy products in Russia, according to experts are: shortage of raw materials, long investment cycles in dairy cattle, the increase of production costs of milk and dairy products, low level of profitability of the dairy industry; low purchasing power of the population, reducing the number of existing enterprises of the dairy industry.

Keywords: *consumption, milk and dairy products, prices, production, the market.*

JEL Classification: *C-10, C-83, M-31.*

1. Introduction

According to the World association of health care milk and dairy products are one of the most important products in the menu of a majority of mankind. Milk and dairy products are included into the Doctrine of national food security of the Russian Federation and have paramount value in the population diet.

Today Russia is one of the world's largest producers of milk and dairy products, however has rather low share of commodity milk in total production of 57%, and on efficiency of a livestock loses to the developed countries more than twice. Production of branch makes to 15% of a turn of retail networks.

With adoption of the Doctrine of national food security the task to provide 90% of internal consumption with own production is set for dairy branch. In 2013 the indicator of security

made only 76%. Thus the indicator of security with commodity milk is lower than another 66%. Refinery capacities of branch are loaded for 60-70%, that is their deficiency isn't the limiting factor for production.

For achievement of the purpose, first of all, it is necessary to define the main tendencies and regularities in the market of milk and dairy products, to define the main features of development of market condition. On the basis of the received results of research it will be possible to make forecasts and to formulate scenarios of development of production, consumption, to estimate influence of factors in the market of milk and dairy products.

2. Data and Methods

Theoretical and methodological basis of research are scientific works of leading domestic and foreign scholars on the theory of regulation of market of milk and dairy products, scientific research and practical recommendations of participants of the market of milk and dairy products of Russia, results of research institutions and centers.

Information base of research are legal documents of the Russian Federation, reports the Federal State Statistics Service of the Russian Federation, the Ministry of agriculture of the Russian Federation, analytical and sociological materials listed in the official reports and scientific publications, as well as personal observations of the author.

In the research process, to perform the tasks the following methods were used: analytical, statistical (correlation and regression analysis, methods of comparison of means, cluster and factor analysis), economic-mathematical, monographic, systematic analysis, methods of expert judgments, sociological observation and survey and other.

3. Results and Discussion

The practical significance of research results is to use the received data and the identified patterns with the aim of forming practical recommendations for improving the regulation of market of milk and dairy products in the Russian Federation overall, as well as improving methods and measures to combat illegal imports of products of the decision-making Federal Executive bodies for the improvement directions and methods of improving the efficiency of all the participants (from producers of animal feed to the public); in the preparation of programs of support of producers of milk and dairy products (in the sector of private farms and agricultural organization) and research and higher educational institutions in the educational process.

The dairy industry is of particular importance for the economy and population of Russia. In the dairy industry and associated industries employs more than 21 thousand organizations and more than 1.2 million people, milk and dairy products up to 15% of the turnover of retail trade networks. Currently, the dairy industry is one of the most import-dependent sectors in the food industry of the Russian Federation.

Today Russia is one of the largest producers of milk and dairy products, however, has a relatively low share of commercial milk in total production (57%) and in productivity of dairy livestock loses developed countries more than 2 times.

The production of milk and dairy products is characterized by a severe decline after the beginning of economic reforms in Russia in the 90 years and is characterized by sharp reduction of volumes of production, supply and consumption until 1999.

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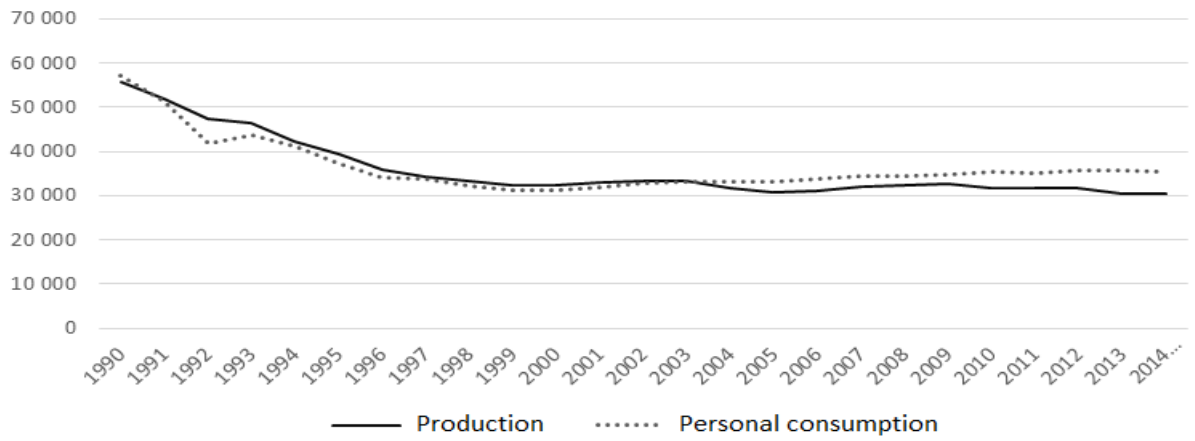
Figure 1: Volume of production and consumption of milk and dairy products in Russia in the period from 1990 to 2014, thousand tons



Source: Federal State Statistics Service [access Mode]: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/economy/#

Milk production and dairy products during the crisis years declined by 45,16% and amounted in 1999 32274 THD the production declined faster than consumption of milk and dairy products. Such dynamics of production may depend on the profitability decline of production in conditions of economic crisis and inflation of production costs.

Table 1: Production of main dairy products, thsd tons

Product name	2013	2014
Whole-milk products (in recalculation on milk)	11155	11144
Powdered skim milk	59	84
Powdered whole milk	28	28
Butter	224	251
Cheeses	343	378
Cheese products	90	116

Source: The national Union of milk producers [access Mode]: http://souzmoloko.ru/analitika/

In 2013 the volume of production of milk and dairy products amounted to 30.66 per million tons (96% by 2012 and 94% to the target). The production of raw milk in agricultural organizations, peasant farms and farms of the population in the period from 2009 to 2014, there is a decrease in production volume by 1% annually, decrease the number of cows in Russia is occurring at the same rate (on average -1% per year). In the analysis of raw milk production from January to September 2015, compared with the same period in 2014, a decrease of 0.3%. In 2015 more than 800 thousand tonnes of milk produced the following Russian Federation subjects: the Republic of Bashkortostan and Tatarstan, Rostov region and Krasnodar territory.

The main reasons for low production of milk and dairy products in Russia, according to experts are: shortage of raw materials, long investment cycles in dairy cattle, the increase of production costs of milk and dairy products; low level of profitability of the dairy industry; low purchasing power; reducing the number of existing enterprises of the dairy industry. Introduced in August 2014. the sanctions that were supposed to ensure food security of the country, could not ensure rapid growth of production volumes of milk and dairy products. As a result, to meet the consumption of the Russians again required the import of milk and dairy products.

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Market of milk and dairy products in Russia up to 1990 was characterized by one of the world's highest levels of consumption per capita per year. In 1990, per capita consumption of dairy products was 387 kg per person per year, in 2014 this figure was equal to 244 kg per person per year of milk and dairy products per person per year (at the recommended rate of consumption 320-340 kg per person per year) . Consumption of milk and dairy products in General during the study period decreased by 37%.

The lowest consumption of milk and dairy products per person per year (less than 200 kg) are recorded in the following Federal districts (FD) and the subjects of the Russian Federation: the Urals Federal district, northwestern Federal district, Chukotka Autonomous district, Sakhalin and the Amur region, the Kamchatka territory, the Chelyabinsk, Tambov and Tula regions, as well as in the Republic of Crimea. The total number of people living in these regions of Russia is more than 10 million people.

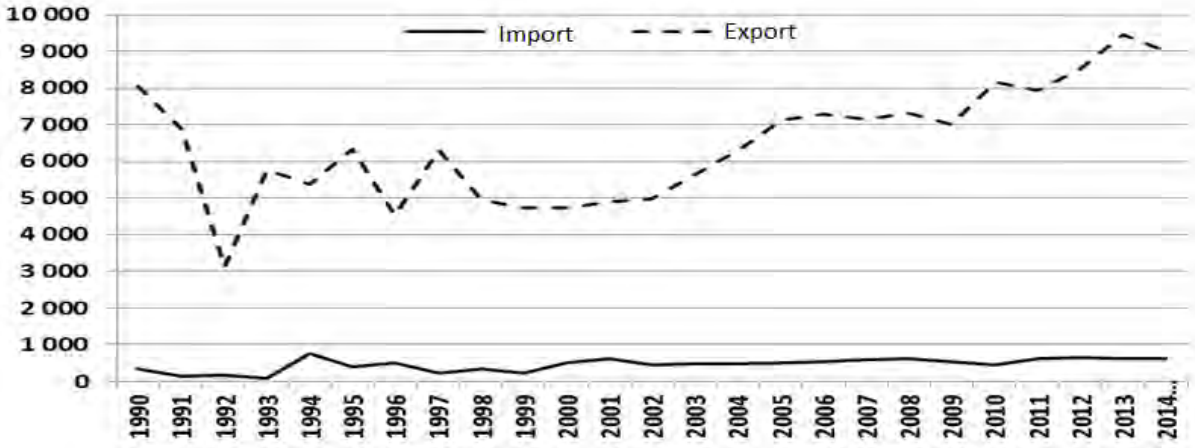
Consumption of milk and dairy products is mainly due to the reduction in real incomes. In 2014, the level of incomes of Russians decreased by 6%, the level of costs fell by 5.4% compared with 2013.

Consumer research showed that in 2014 the growth of prices for food products led to an increase in the number of families and households, which redistributed the family budget in favor of only the most necessary food, the number of families and households, which had a consumption of some foodstuffs increased by 11%, and the number of families and households that consider their income sufficient decreased in 2014 by 8%.

The highest level of consumption of milk and dairy products accounted for the subjects of the Russian Federation included into the Central Federal district. Marked the market capacity at constant reduction of production of raw material (milk) for regions of the specified County in the short term will become a serious obstacle for development of the market of milk and dairy products.

Throughout the reporting period note a specific feature of the market of milk and dairy products: permanent the excess of consumption over production of milk and dairy products in Russia. It is important to note that the gap between consumption and production in the monitoring period has steadily increased. Noted the steady increase in consumption over total production led to the growth of imports of milk and dairy products.

Figure 2: Import and export of milk and dairy products in Russia in the period from 1990 to 2014, thousand tons



Source: Federal State Statistics Service [access Mode]: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/enterprise/economy/#

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Lack of own production have been covered by a permanent increase of volumes of import of milk and dairy products, which in the period from 1990 to 2014 as a whole increased by 11.84%, mainly by reducing its inventory by 10.51%.

Table 2: Import of milk and dairy products in 2013 and 2014, thousand tons

Product name	2013	2014	The relation of 2014 by 2013, %
Butter	165,1	158,0	95,7
including from Belarus	63,9	66,9	104,7
Cheese and cottage cheese	466,0	348,2	74,7
including from Belarus	136,7	163,4	119,5
Powdered milk and concentrated	255,8	199,0	77,8
including from Belarus	210,1	175,1	83,3
Whole milk	323,1	347,3	107,5
including from Belarus	281,9	318,6	113,0

Source: The national Union of milk producers [access Mode]: http://souzmoloko.ru/analitika/

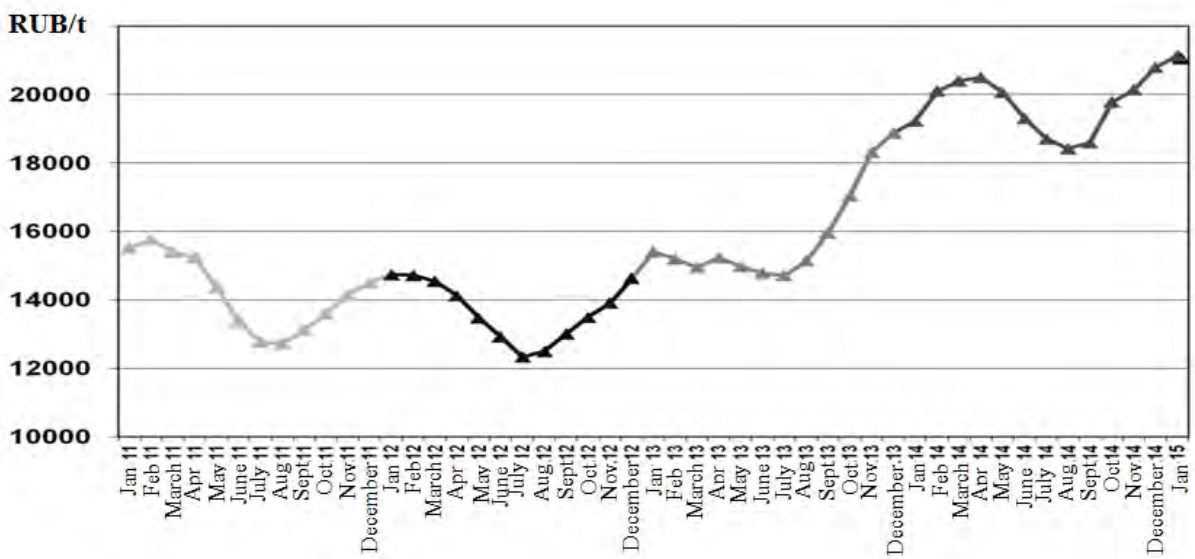
The volume of imports in Russia in 2014 compared with 2013 increased following the main suppliers of dairy products: Finland 6.3%, Poland by 26.5%. After the introduction of the food embargo dramatically increased the volume of products supplied to Russia the Republic of Belarus: dairy products 17.3%, dairy products by 23.4% and of cheese by 22.9%.

It should be noted the decline in export volumes of milk and dairy products (recalculated to milk) from Russia in the period from January to September 2015, compared with the same period in 2014, the observed decrease of 11% in Kazakhstan and former CIS countries.

Consumption of milk and dairy products is mainly due to the reduction in real incomes. In 2014, decreased the level of income of Russians 6%, the level of expenditure has reduced by 5.4% (compared to 2013).

In the situation when supply exceeds consumption, that is, during low market conditions, supply and demand could be balanced only at low market prices. Dynamics of average prices of producers of raw milk in Russia in the period from 2011 to 2015 is presented in figure 3.

Figure 3: Dynamics of average prices of producers of raw milk in Russia, RUB/t



Source: Information Agency "Milknews" [access Mode]: http://milknews.ru/analitika-rinka-moloka/

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In Russia fluctuates greatly on the price of milk and dairy products, increased prices in some years was as high as 60% per year. In the period from 1991 to 2005, purchase prices for milk from fixed has become highly volatile. These fluctuations are primarily concerned with the shortage of products, the natural seasonality of production (seasonality of milk production requires a separate and incremental approach to the solution), climatic features.

Current state of the market of milk and dairy products is also due to its haphazard regulation and reform. It is also necessary to develop and realize actions for improvement of activity of producers of milk and dairy products in the conditions of implementation of the social program for control of consumer prices.

Difficult situation on the market without the use of radical and complex measures in the medium term will lead: to a new decline of production of milk, to a substantial increase in the prices of raw milk and dairy products in General, for increasing sales of counterfeit products.

4. Conclusion

In the study, the author reveals the specific features of the market of milk and dairy products in Russia in the period from 1990 to the present time on the basis of the main trends in the dynamics of production and consumption of products. Identified and systematized the main factors that influence the production, import and consumption of milk and dairy products, changes in the structure of consumption of milk and dairy products.

The market of milk and dairy products in Russia requires a more active state intervention in the processes of regulation and support of commercial milk production, reductions in interest rates on loans for agricultural producers, monitoring the quality of materials used, the process of breeding animals, the quality of produced milk.

The analysis of the condition of the market of milk and dairy products shows a direct dependence of the level of production from seasonal and regional factors, the price of milk (significant dependence on the type and quality of products, brand and packaging), a relatively low share of producers in retail price (may be associated with low cooperation of manufacturers).

Identified the price situation on the market of milk and dairy products, which primarily related to the high volatility of prices for finished products. The price situation on the market of milk and dairy products in Russia contributed to the increase of import volumes from Belarus.

The main reasons for high volatility of purchasing prices for raw milk: the low degree of cooperation of the producers of raw milk, the shortage of raw milk in Russia, the dependence of milk production to seasonal factors that limited the shelf life of raw milk, the lack of modern production capacities for the production and storage of milk as stocks, the lack of available logistics between regions.

To achieve in 2020 the highest results in the industry needs to increase funding and public support of new projects of commercial milk producers, to improve the efficiency of production in agricultural organizations, to increase the marketability of agricultural organizations and peasant farmers by 10-15%.

It is necessary to regularly monitor the changes on the market of milk and dairy products for the purpose of operative state regulation, making decisions on the use of the protection or strengthening of the liberal approach, depending on changing business conditions.

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Development and level of consumption of chosen foods in Slovakia and Austria

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Abstract
Analysis of food supply and demand is a valuable part of everyday decision making of consumers, primary producers, food producers and retail chains. The basic indicators that allow evaluating the level and development of living standards in the country are disposable cash income, consumption expenditures on food, housing, clothing, rent, energy and medical care. The paper points at the development of expenditures for food and consumption of chosen foods in Slovakia and compares it with Austria. Expenditures for food and non-alcoholic beverages in Slovakia were 23.1% and exceed food and consumer spending in Austria by 19.1%. On the other hand the transportation expenditures in Slovakia were by 50% lower in comparison with Austria. Structure of the other obligatory expenditures in both countries was developing comparably identical. The most significant differences were in the level and development of achieved average income. For example, in 2013 was the average monthly income in Slovakia accounted for only 47.55% of the salary in Austria (€ 1,737). Development of material level of food consumption is differentiated and recording the differences in the consumption of milk, which was all higher in Austria by 63.3% (76 , 9 kg), cheese consumption by 45.0% (20 kg) beef by 37.1% (12 kg), fruit by 73.1% (75.5 kg) and vegetable by 45.2% (113.6 kg). In Slovakia was the only higher consumption of poultry and in particular substituted the demand for pork and beef.

Keywords: *Consumption of Chosen Foods, Expenditures for Food, Housing, Energy, Development of Average Wage*

JEL Classification: *Q13*

1. Introduction

Recently during the process of globalization Slovakia had passed the phases of economic growth as well as the economic crisis, these factors affect the standard of living and behavior of households and make the formation of a lifestyle change. Household income is reviewed in the economic studies in relation to the political, economic and social situation of the society, analyzing the factors that affect income inequality and by which instruments state conversely affects the income situation of households.

The behavior of the population in the market of goods and services is affected by successive changes in economic conditions in the context of the transformation process. In the short term is determined by income development at the level of companies and households and by changes in the price development of goods and services. This involves the deepening polarization of the population in terms of income. Polarization of income also bases the polarization of consumption expenditures and savings. Income polarization is the emergence of the new target groups with a shift in range and quality characteristics of goods and services. In the long term is the consumer behavior influenced predominantly by demographic developments and integrated consumer patterns, which are characterized by the relative inflexibility in the longer term. These are changing gradually, depending on the socio-economic conditions and cultural routes - patterns. (Pachingerová, M. 2000).

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In practice suffer the effects of globalization affect the development and significant change in the agrarian business. They include supply and demand site of agrarian markets throughout the structure. This leads to the development of global food networks and a prerequisite for the success of each of their components becomes awareness and the ability to use the information for immediate evaluation of the market situation and immediately respond in the offer. (Zentková, I. - Hošková, E. 2010).

Inhabitants´ standard of living is usually compared according to the absolute consumption of food in its natural expression as well as the basis of the proportion of food expenditures in total consumption expenditures and the share of expenditures on each of the food groups in the context of food and non-alcoholic beverages expenditures. Over time, rising incomes translate into rising food expenditures and change in consumption patterns. However food differs from the majority of products and services by the fact that their physical consumption can not grow indefinitely, although quality can grow (Kubicová, L. 2008). Growth of income per capita is associated with slower growth in food expenditures, while expenditures on housing, energy, healthcare, transportation are increasing. Development of obligatory expenditures is inversely dependent on the household income, but while food expenditures have increased, their share in total expenditures in Austria and the industrialized countries of the EU were falling more sharply than in Slovakia.

2. Data and Methods

Problem-solving process is based on the findings of a study published in the professional papers at home and abroad. The quantitative analysis is based on information taken from the Statistical Yearbook of the Slovak Republic and Austria and from publications Agrar Markt Austria. There were applied the basic descriptive statistical methods describing the level and trends of the monitored parameters using software Microsoft Excel.

3. Results and Discussion

3.1 Development of Gross Domestic Product, Households Income and Consumer Expenditures in Slovakia

Level of income and expenditures of inhabitants depends on the changes in gross domestic product characterizing the level of economic activity of the country. Development of GDP, net cash income, consumer expenditures and consumer prices of households in Slovakia reflect the data in Table 1.

Table 1: GDP per capita, Net Cash Income and Consumer Expenditures of private Households in €

Index	2010	2011	2012	2013	2014	k´
GDP at fix prices(prev.year=100)	12,069	12,596	12,989	13,525	14,028	1.038
NCI index nom. growth (prev.year=100)	99.5	103.7	101.3	101.0	105.5	x
NCI index real. growth (prev.year=100)	98.5	99.8	97.7	99.6	105.6	x
Price Index(prev.year=100)	101.0	103.9	103.6	101.4	99.9	x
Net Expenditures in €	3,693.0	3,849.5	3,871.3	3,847	3,860	1.011
Expenditures on food and non-alcoholic beverages in %	22.1	21.8	22.3	23.1	22.9	x

Source: SO SR, authors´ own calculations

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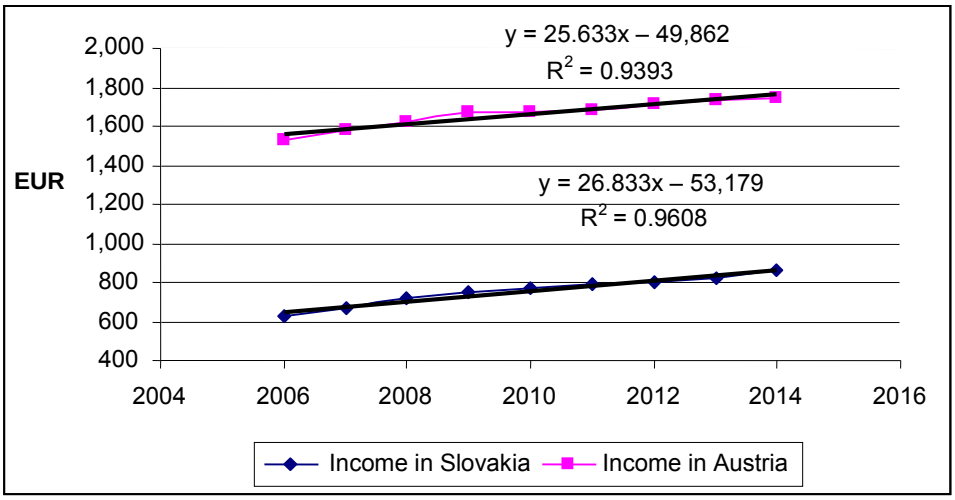
In recent years, the economic results in Slovakia have proved a slight increase in gross domestic product per capita, which is reflected in the increase in nominal and real net cash income. Households responded to the annual increase in revenue by slight increase in consumer expenditures. Since 2011, the consumer price indices have gradually declined year by year, in 2014 consumer price indices for food and non-alcoholic beverages fell in comparison with 2013 at level of 99.2%. It can be said that inflation is not threatening factor as we assume that inflation is low and stable. The negative consequence associated with inflation is the uncertainty when the rate of inflation is unstable and the price trend varies significantly over a certain period. It can cause rapid changes in supply or demand for services and goods. Although that in the period 2006-2014 the average increase in monthly income was 4.1% in Slovakia while in Austria the monthly income increased by an average of 1.8 % per year. In 2006 monthly income in Slovakia was only 40.72% of the average income of an employee in Austria (€ 1,530). During nine years, this income gap had decreased, as indicated in Table 2 and Figure 1, mainly due to higher average monthly income increases. Even though in 2014 the average monthly income in Slovakia was low and continued to represent only 49.1% of salaries in Austria (€ 1,746).

Table 2: Average Monthly Income of Employee in Slovakia and in Austria in €

	2006	2007	2008	2009	2010	2011	2012	2013	2014	k´
Slovakia	623	669	723	745	769	786	805	824	856	1.041
Austria	1,530	1,579	1,617	1,669	1,674	1,683	1,716	1,733	1,746	1.018

Source: SO SR, Statistik Austria

Figure 1: Development of Average Monthly Income in Slovakia and in Austria in €



Source: SO SR, Statistik Austria

3.2 Development and Level of Expenditures on Food, Housing, Energy and Transportation in Slovakia and Austria (in %)

The structure of consumer expenditures by purpose of use (Table 3) shows that the share of expenditures that fall into the category of so-called obligatory expenditures (which includes food, beverages, clothing, rent, fuel, energy, medical care) remain draining a crucial part of consumer expenditures. In 2014 was their share of consumer expenditures amounted to 56.4%. Due to the high share of obligatory expenditures is reduced scope for so-called discretionary spending (expenditures for transportation, recreation and culture, education, cafes). The above

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changes are mainly due to changes in income, which creates a different room for maneuver for individual households by social status and income groups (employees, self-employed, pensioners, etc.). In comparison with Austria, in Slovakia were higher consumption expenditures mainly for food, which fell from 24.7% (in 2004), but still oscillated at level higher than 22%. In favor of Slovakia was the favorable development primarily in the spending of funds for housing, energy and transportation (Kubicová, Ľ. - Kádeková, Z.2010). Hard budget constraints of households in Slovakia caused that consumer habits and choices has been determined by income level, family structure and status and higher unemployment compared with Austria.

Table 3: Comparison of Consumer Expenditures in Slovakia and Austria in 2014 (in %)

	Slovakia	Austria
Food, Non-alcoholic Beverages	22.9	12.1
Housing, Water, Electricity and Fuel	19.9	23.8
Transportation	7.6	15.0
Alcoholic Beverages and Tobacco	3.1	2.4
Clothing and Footwear	6.0	5.7

Source: SO SR, Statistik Austria

Comparison of consumption of selected foods in Slovakia and Austria was based on the values presented in Table 4 and Figure 2. There was significant lower consumption of nearly all food commodities in Slovakia (except consumption of poultry meat and potatoes) compared with consumption in Austrian households. In terms of the recommended doses and food consumption was actually exhibited the least favorable nutritional situation in the beef consumption, which in Slovakia represented only 36.6 percent share of consumption of Austrian households. Also in terms of healthy and wholesome diet was in Slovakia recorded a negative situation in cheese consumption since consumption at level 9.2 kg per person per year represented only 46.0 percent of consumption exhibited in Austria and was considerably lower than in other countries of the European Union. Similarly, we can characterize the negative trend in the consumption of milk and dairy products in Slovakia, where is the long-term decrease in consumption of milk. Due to the increasing consumption of flavored and sour milk products in the past ten years, the situation develops favorably, but consumption of 48.7 kilograms of milk per person per year reached only 63.3 percent of its consumption in Austria. Slovakia is lagging behind the consumption of vegetables - in 2013 in Austria reached level of 113.6 kg per person per year while only 104.7 kg per person per year in Slovakia. It means a difference of 8.9 kg (7.8%). Consumption of fruit was in 2013 in Slovakia 54.9 kg per person per year and 75.5 kg per person per year in Austria, which indicates the difference 20.6 kg (27.3%) in favor of Austria.

Table 4: Comparison of Consumption of Selected Foods in Slovakia and Austria in 2013 (in kg)

	Beef	Pork	Poultry	Milk	Cheese	Butter	Potatoes	Vegetables	Fruit
Slovakia	4.4	30.9	16.9	48.7	9.2	3.0	47.4	104.7	54.9
Austria	12.0	39.1	12.2	76.9	20.0	3.0	46.6	113.6	75.5
Share of SR	0.366	0.79	1.385	0.633	0.46	0.0	1.017	0.92	0.727

Source: SO SR, AMA Marketing

Figure 2: Consumption of Selected Foods in Slovakia and Austria

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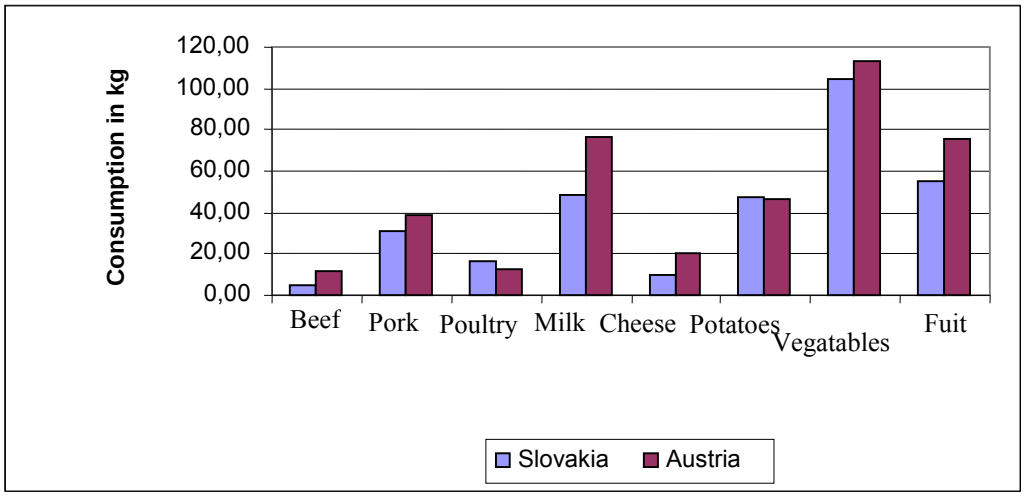

Source: SO SR, AMA Marketing

3.3 Comparison of Price Levels of Selected Foods in Slovakia and Austria

Consumer choice in the market and particularly in the market for daily consumption of food and non-alcoholic beverages depends not only on the disposable cash income but also on product prices. Consumer price is one of the factors that influence the demand for certain goods or services. Special status between consumer prices of goods belongs to the food prices, which is reflected by national conditionalities that limited growth tends to push up consumer prices and on the other hand the nutritional function tends to pull consumer food prices down. In this part of operation is very difficult to find and keep the equilibrium. Current price affects not only demand but also supply. Different level of income in Slovakia and Austria are also reflected in different levels of consumer prices, which are in the vast majority of food lower than in Austria, which is documented by the data given in Table 5.

Table 5: Comparison of Price Levels of Selected Foods in Slovakia and Austria in 2013 (in € per kg)

Foods	Slovakia	Austria
Boneless Pork Leg	4.77	9.42
Fruit Yogurts	2.74	2.42
Potatoes	0.69	1.41
Crystal Sugar	1.09	1.2
Pasteurized Skimmed Milk	0.76	0.69
Fresh Butter	8.32	6.56
Olive Oil	8.55	10.72
Gutted Chicken	2.71	5.21
Apples	1.34	2.05
Egg Pasta	2.26	3.42
Husked Rice	1.45	2.26
Fresh Hen Eggs	0.17	0.28
Semi Coarse Wheat Flour Selection	0.49	1.08

Source: SO SR, Statistik Austria, authors' own calculations

4. Conclusion

The aim of submitted paper was to compare the level of food consumption in Slovakia and Austria and to highlight the factors that determine consumption in terms of availability and disposable income of the population. Average monthly income in Slovakia grew faster than in Austria. In Slovakia the average monthly income increased by 4.1% per annum while in Austria, this increase was only 1.8%. In 2006, monthly income in Slovakia was only 40.72% of the average income in Austria (€ 1,746). In 2014, this gap eased due to higher average monthly income growth in Slovakia, but still accounted only 49.1% of income in Austria (€ 1,746). Expenditures on food and soft drinks made up 23.1% and exceed the food and consumer expenditures in Austria (12.1%) by 19.1%. On the other hand, in Slovakia were 50% lower expenditures on transportation in comparison with Austria. Food prices in Slovakia had been lower than in Austria, especially the price of meat, poultry, olive oil, whereas in Austria has been lower prices of yogurt and milk. Height of consumer expenditures on housing, water, electricity and fuel were about the same, in Austria a bit higher by 0.9%. Expenditures on alcoholic beverages and tobacco were 1% higher in Slovakia than in Austria. Consumer expenditures on clothing and footwear were at a comparable level in Slovakia (6%) and Austria (5.7%).Lower wages in Slovakia had been mainly reflected in the consumption of beef, which represented only 36.6% of consumption in Austria, 46.0% of the consumption of cheese and 63.3 % consumption of milk. In Slovakia was higher food consumption only in poultry (by 4.7 kg) and potatoes (by 0.8 kg) in comparison with Austria.

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Food consumption behavior in seniors´ segment

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Abstract
The goal of our paper is the identification of the determinants impacting food procurement process of older customers and to propose some recommendations to retail managers aiming at better consideration and meeting the expectations of the older people. To evaluate the effects of particular factors and explore the beliefs and expectations that influence food consumption, we applied the qualitative research methods with focus groups aiming to provide an in-depth, complex understanding of how seniors see and interpret their satisfaction. The qualitative analytical approach chosen in our research was thematic content analysis. The purpose of employing focus groups lies in selecting information-rich cases for study in depth. Sampling design therefore was more purposive rather than random. The research questions posed by the research have arisen out of the need to gain insight into aspects of seniors´ consumption behaviour. The findings from group interviews were supported by the results from a questionnaire. From a retail management and marketing point of view our findings call for a stronger consideration of seniors´ customer segment in food offerings and store layout. Both qualitative and quantitative results revealed that age dimensions influence perceptions and behaviour related to food consumption.

Keywords: *food consumption, seniors, shopping behavior, retailing*

JEL Classification: *M30*

1. Introduction

Seniors have been usually viewed as an unattractive market due to the perception that they had limited spending power and the image of old people being frail. However, this perception seems to be short-sighted, because not only will be this market growing for the near future, but new pensioners with higher income will come to the segment. To justify studying the seniors´ age group, there are a number of factors that differentiate them from other segments. These factors depend on changes in health, lifestyle and psychographic characteristics resulting in specific marketplace needs.

The purchase behavior of older consumers differs somewhat from that of their younger counterparts. Many authors (Moschis, 2003; Pettigrew et al., 2005; Petterson, 2007) have specified such differences, which include: expecting personal attention and special services, considering shopping to be a social event, perceiving brand and retailer reputation, longer time in purchase decision-making, increased store loyalty, etc. Given the range of differences noted, retailers need to give them serious consideration and use them to differentiate their services to different consumer segments.

Satisfaction with an activity is a necessary precondition for repeat behavior (Nagyova et al., 2014). With regard to food retailing, consumers face an array of stores in which to shop and the level of choice that exists is immense. In order to guarantee satisfaction, consumers´ wants and needs must first be recognized.

With advancing age seniors experience a decline in appetite, food intake and dietary adequacy (Hare et al., 2001) as well as a decreasing ability to taste and smell, chewing difficulties and

limited dexterity. Food product developers and retailers should be aware of these changes and tailor their products and services to their customer needs.

Several areas of seniors´ satisfaction with the shopping have been identified. Within the store environment, problems have been reported with the use of some facilities, such as large trolleys or large baskets. Also problems with reading price displays and labels on shelves were found to be important to satisfaction (Oates et al., 1996). Several studies found respondents had difficulties reaching high and low shelves and to use deep freezers (Leighton et al., 1996). Seniors suggested that in such cases they either did not purchase the item or had to find staff to help. Older consumers would like to have seats in stores when they feel tired or good lighting within the store.

Display of products has been found to be very important (Oates et al., 1996; Lumpkin et al., 1985). Changing displays of products around a store as a part of retailers´ display policy has been frequently criticized by older consumers.

One aspect of dissatisfaction identified in numerous studies has been the service at check-outs (Goodwin & McElwee, 1999; Johnson-Hillery et al., 1997). Long queues at check-outs and overcrowding causes dissatisfaction in older consumers.

Products- related aspects are very important for older consumers (Moschis, 1991). One aspect which is frequently reported to be dissatisfying is the quantity in packaged food. The quantities of food normally packaged were reported as being too large for older people with smaller appetites, particularly when the food is bought for one person (Lumpkin, 1985). Price is also recognized as being decisive factor to older people, particularly for those with low incomes.

Finally, staff and service are important in ensuring satisfaction among older consumers (Johnson-Hillery et al., 1997). This is particularly relevant in availability of staff ready to help with locating products, information on products and advising (Goodwin & McElwee, 1999). Just as staff can bring satisfaction, it can also cause dissatisfaction when they are unfriendly and unhelpful.

Hence, there appears to be a broad range of factors influencing the satisfaction of older consumers when shopping for foods. These factors will be explored and recommendation presented to improve satisfaction level.

2. Data and Methodology

Both qualitative and quantitative research methods were employed for the purpose of this study, whereby each played a distinct yet complementary role. Criteria for inclusion in the research were elderly people aged over 60 years, living independently and carrying out their household shopping. Participants for the research were recruited through senior clubs and age-specific organizations.

Qualitative data was initially obtained with the aim to focus the study and to construct the questionnaire. The data was collected using focus group interviews. Focus groups were used as they are particularly suited to the study of peoples´ knowledge, attitudes and experiences. Two focus group interviews were held with 10 participants each, of both gender and aged 60+ years.

The purpose of the interviews was to identify the main food shopping issues experienced by older people and to find out whether or not they were satisfied by the current food retail service.

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The focus group interviews were recorded and analyzed according to principles of content analysis, where substantive statements were identified from individual transcripts (Stewart et al., 2007).

The analysis was conducted in more stages. In step one, texts were presented as a whole, a so called naive reading. Statements were then made based on the impressions of and reflections about the wholeness and important elements in the text that had emerged during the naive reading. Then all parts of the text relating to the aim of the study were divided into meaning units that seemed to be similar. In next step the meaning units were coded. The codes were critically discussed and a number of categories with subcategories emerged. Finally, all texts were re-read and compared with the outcome of the analysis to ensure that the categories covered the contents of the texts and codes. Three categories with twenty subcategories were identified based on the text analysis: food store accessibility (with subcategories: store location, store category), in-store environment (with subcategories: store size, store design, products display in shelves, product variety, trolleys and baskets, checking points, knowledgeable and professional staff, store assistance, regular advertising, sales promotion), product-related factors (with subcategories: quality of products, breath of the product assortment, product size, product affordability, discounts and bargains, products packaging).

The qualitative research was supported by results from a questionnaire (n=468), which documents numerically the findings described in the focus groups. To explore the food shopping satisfaction, respondents were asked to evaluate 20 factors (subcategories) impacting on their food shopping satisfaction. Finally, factor analysis was used to reduce and identify the crucial factors determining seniors´ satisfaction when shopping for foods.

Three principal goals are formulated in our paper: to identify the attributes with positive and negative impact upon food shopping experience in older customers segment during their food procurement process, to reveal the importance of factors determining food shopping satisfaction and to propose some recommendations for retail sector aiming at better consideration and meeting the expectations of the older people.

3. Results and discussion

From the consumer focus groups, the shopping patterns of older consumers were revealed, areas of satisfaction and dissatisfaction in food shopping recognized and explored later employing the data from questionnaire analysis. To determine the food shopping experience of seniors, three principle categories with 20 subcategories / attributes were generated into statements that respondents had to judge for satisfaction during their shopping.

3.1. Store accessibility

Nearly a quarter (22%) of adults aged 60 years and over have mobility difficulties and hence difficulties in shopping. For these people it can be difficult getting to a shop and carrying their shopping home. These mobility difficulties can influence a switch in loyalty between different types of store. Older people who find it difficult to travel to larger supermarkets, reported to prefer shops close to their place of living.

The choice of food store was based on a variety of reasons which included: price-level, close proximity to home, habit or routine and lack of choice. The reasons influencing store choice decisions were: lower prices (30%), habits and routine from the past (25%), proximity to place of living (24%), broad choice and variety of foods (13%), pleasant atmosphere (8%).

Unlike to our expectations, proximity to place of living, which is frequently cited in the literature to be a key attribute influencing store choice (Moschis et al., 2004), was not

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confirmed in our study as the most decisive factor. Consumer questionnaires revealed that 30% of respondents base their store choice decision on the price-level of foods purchased, 25% on habits and routine from the past and only 24% on the proximity to place of living, which may suggest that older consumers may be adapting to their difficulties.

Various retail categories were noted to be the place of shopping, including supermarkets, smaller food stores and independent retailers. More than one-third (38 %) of the participants carry out their regular food shopping in supermarket, 30 % use smaller food stores for their grocery shopping and 32 % patronize independent retailers.

3.2. In-store environment

Older consumers face a range of in-store difficulties when shopping for food, particularly the narrow aisles, poor shelf signposting, shelves that are too high or low, a lack of adequate rest and toilet facilities, deep trolleys and freezers, that make it difficult to do shopping.

Nearly one quarter (23 %) of seniors perceive the size of the supermarket to be a problem in their shopping, having a negative impact upon the food shopping satisfaction. Because of their restricted mobility it was hard for them to walk around. In light of the difficulty with store size, it was not surprising that 35 % of older people were unsatisfied with the provision of seating. It was stated: “There are no seats in the shops where you could rest a little”, or “A seat is a very important factor for anyone who cannot walk far”. These findings were confirmed in both focus groups: „After shopping I sometimes need to sit down for a minute or need to sort my bags out before carrying them home, but there are often not any / enough seats.“

Checkout queuing and long waiting times were highlighted as one of critical attributes for seniors: “Standing in the queue if there are so many waiting to be served is hard for me”. One of the serious problems reported was a lack of assistance: “I miss somebody to help me to pack my goods”, and “With somebody standing behind me, I feel guilty to be such slowly”. Crowded store and queues at the pay desk have a negative influence on the seniors´ shopping satisfaction.

Respondents expressed also difficulties with reaching high and low shelves and with the use of deep freezers. They suggested that in such cases they either did not purchase the item or had to find staff to help. One in six respondents experience the inability to reach goods and consider inappropriate shelf height to be the main in-store difficulty. It is illustrated in the following quotations: “Sometimes the goods tend to be too high”, or “I could not reach up to get the goods”, or “I cannot stoop down to the lower shelves, so someone has to do that for me”. Consequently, older people have no other possibility, but to ask others for assistance in accessing products when in-store.

The trolleys were seen both to be an aid which can be used by seniors as a support when they are in-store, but also a problem, when large and deep. This was verified in the following comments: “Trolleys give you balance when you are not able to walk”, or “I use the trolley to lean on it”, but also “I have problems at the checking point to get the goods from the deep trolley”. However, preference is given to trolleys (88%), not to baskets, because they are more convenient and of help for those with restricted mobility. Overall 88 % of the respondents said they were satisfied with the trolleys.

Ease of finding products has been found to be very important (Oates et al., 1996; Lumpkin et al., 1985). Retailers often move displays of products around the store as a part of their display policy and such a practice has been criticized by older consumers as well as by younger consumers.

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Product relocation caused confusion among older people and in some cases was named as a reason not to shop in supermarket stores: “We find it very confusing, if the item is one week here and the next week it is somewhere else”, or “You are running around the store, whereas in independent stores goods are in the same place and you know where to find it”. The importance of familiarity in store was used as a justification for continuing to shop in the same store and one in four seniors (25%) base their store choice decision on habit / routine. The following quotes illustrate this: “You know in smaller stores where everything is located, but when you go to a supermarket, you are lost”, or “They continually move the items from one to other shelve”). Hence the issue of product relocation has the possibility for either encouraging store patronage or losing a customer.

Over one-quarter of people aged 60 and over, and nearly half of everybody aged 75 and over live alone. The retail is however very much focused on the larger households. A particular example that causes much dissatisfaction among older people is the widespread use of buy-one-get-one-free offers (BOGOF) and similar multi-buy deals that offer discounts for buying in bulk. For those who either live alone or are not able to carry a lot, these offers have the opposite effect (Hughes et al., 2004). Older people expressed criticism that such BOGOF offers are impractical for them to purchase because they often are no able to consume greater quantity within the use-by-date. 75 % of the questionnaire respondents believe multi-purchase promotions are not good value for them. The respondents claimed: “You have to throw it out, because we are not able to use it, it is a waste”.

Staff and service are crucial in ensuring satisfaction among older consumers (Johnson-Hillery et al., 1997). This is particularly relevant in availability of staff ready to help with locating products, information on products and advising (Goodwin & McElwee, 1999). However, staff can not only bring satisfaction, it can also cause dissatisfaction when they are unfriendly and unhelpful.

The retailer staff were reported with only 42 % in a positive light. Staff was commented as not being polite and willing to help. The questionnaire data found that 26 % of older people were satisfied with customer service and further 16 % very satisfied. The retailers´ policy of taking the customer to the product when asked for assistance in-store was viewed favorably among older consumers. This is beneficial for retailers as poor service and unhelpful staff can have an immediate negative effect on customers and decreases the likelihood of them becoming loyal to that store (Hayley and Lumbers, 2008).

A further negative aspect stressed in the focus groups was the impersonal service provided by staff in supermarkets. Older people do not experience in large stores the same approach they may have been used to when shopping in smaller local stores. In larger stores seniors reported having some difficulty in finding a member of staff who is willing to help them and bring them to the goods needed. Their experience with staff helpfulness varied. „Sometimes staff give directions to products, but it would be better if they could take me to them”. It was found in the focus groups that seniors in generally do not like to ask staff for help (40 %).

3.3. Product-related factors

Product-related aspects are very important for older consumers (Szmigin & Carrigan, 2001). Not only price, which is recognized as being important to older people (particularly for those with low income) plays an important role in food shopping perception. It has been found that older people perceive the price of foods to be high, which can be caused not only by their low pensions in Slovak Republic, but also by higher VAT tax-levels on foods in the country.

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The majority of older consumers expressed satisfaction with the range and variety (92%) of product choice in store, stating: “They have everything I want and even more”, or “I can get everything I want”. Only 8 % of research respondents reported they are not very satisfied with the range of food available in a store and 12 % are not satisfied with the quality of food products.

One factor which was frequently identified to be dissatisfying is the quantity in packaged food. The quantities of food normally packaged were reported as being too large for older people with smaller appetites, particularly when the food is bought for one person. Respondents complained that food was often sold in portions too large for older people living on their own. As a result they often have to have the same food for three-four days in the row, to avoid wastage. This mainly related to fresh products such as meat, fruit and vegetables, but also to some tinned products. One respondent reported: “The size of the portions, in which the foods are sold, prevents me from buying some items”. If food products were available in smaller portion sizes, this would be of much help and greater use to 82 % of older shoppers.

It was found that 62 % of respondents read food labels and the information provided on food packaging. Because older people are usually more health-conscious, they obviously read the ingredients on the labels before buying. However, the small size on such labels and packaging caused problems for older people (66%) when food shopping, as they were too small to be legible. Many of them were frustrated by the fact that the ingredients were written in a very scientific language and it was difficult to recognize what the food actually contained.

Respondents commented that many of the use-by dates are printed too faint, or there was insufficient color contrast. Yoghurt and cream were cited as examples where there was poor color contrast on packaging, making people unsure whether they were still safe to eat.

Focus groups reported: “The instructions are so small, that I cannot see them at all”, or “I have to ask someone else in the store to read the information for me”, and „I would recommend that all food products state the ingredients of products clearly and put the content of fat, sugar and salt in the food in a large bold print”.

Many seniors indicate problems with food packaging, particularly with opening jars or tins. Most of the respondents (65 %) confirmed they had problems opening packaging. Cans, vacuum sealed containers and cartons were all named as examples of products that are hard to open. Some also found ring-pulls difficult, despite the fact that these are aimed to make tins easier to open.

3.4. Factors critical in terms of their contribution towards the overall satisfaction

Factor analysis was used to identify the attributes and the relevant factors that seem crucial for customer satisfaction. Factor analysis suggested three main factors, which were then used for rotation. An attribute loaded on a specific factor, when the loading was 0,3 or greater for that factor. Six items loaded on the first factor, three on the second and four on the third factor. Table1, Table 2 and Table 3 reveal attributes and corresponding factor loadings.

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Table 1. Factor 1 and relevant attributes identified through factor analysis as crucial for customer satisfaction – Convenience of shopping

Attribute Code	Attributes relevant to Factor 1 Convenience of shopping	Factor loadings
C1	Well organised store design/ layout	0,524
C2	Practical shelf layout	0,479
C3	Comfortable and clean trolleys	0,43
C4	Knowledgeable and professional staff	0,408
C5	Short queues at checking points	0,396
C6	Convenient store location	0,382
Percentage of variance (%)		23,41

Source: own calculation

Table 2. Factor 2 and relevant attributes identified through factor analysis as crucial for customer satisfaction – Value for money

Attribute Code	Attributes relevant to Factor 2 Value for money	Factor loadings
C8	Fair price / cheaper products	0,691
C9	Frequent discounts /bargains in store	0,604
C10	Regular promotions / demonstrations	0,312
Percentage of variance (%)		18,05

Source: own calculation

Table 3. Factor 3 and relevant attributes identified through factor analysis as crucial for customer satisfaction – Product related attributes

Attribute Code	Attributes relevant to Factor 3 Product related attributes	Factor loadings
C11	High quality products	0,511
C12	Freshness of products	0,502
C13	Practical packaging	0,311
C14	Large product variety	0,303
Percentage of variance (%)		13,02

Source: own calculation

Three groups of attributes were identified and named in terms of their distinct attributes. The first factor, convenience of shopping, contains 6 attributes that can be associated with comfortable shopping and minimum frustration; the second, indicating value for money, consists of three attributes that have relevance to the financial site of the shopping and communication of the value-for-money aspect. The third factor, product related attributes, contains four attributes related to various aspects of product offerings.

Instead of twenty partial attributes of customer satisfaction discussed earlier in the paper, only these three factors were identified as crucial in terms of satisfaction judgement. Both the first factors of customer satisfaction, namely shopping convenience and value for money make a significant contribution in terms of satisfaction.

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4. Conclusion

This paper highlights the purchase behavior shopping satisfaction of older people during their food procurement process. Seniors face several positive and negative aspects in the food shopping. Through both quantitative and qualitative research the critical areas for improvements in seniors´ food shopping satisfaction could be identified: lower ("fair") prices, larger print on food labels, shorter checkout queues, single unit promotions, smaller portion sizes, easy to open packaging.

The results of this research revealed also that older people consider the social element and experience of food shopping to be a positive factor. The social aspect of food shopping is very important to this age group and regular social interaction is recognized as a key element in maintaining both mental and physical wellbeing as people age.

Price level has been cited as one of the most important reasons when older consumers make decisions regarding where to shop. Further important decisive factors have been habit and routine from the past, and proximity to the place of living.

The satisfaction of older people can be improved by the provision of adequate trolleys that provide support for those who need help due to mobility restrictions or due to the impact of advancing age. Staff can also enhance the shopping satisfaction by providing in-store assistance and friendly service.

One positive attribute experienced by the consumers in our study was the variety and choice of food products available for purchase when shopping food. The majority of older people (74 %) are satisfied with the current range of food that exists. Satisfaction with product choice was very high.

Several in-store attributes impact negatively upon the food shopping satisfaction. The internal store environment has been identified as a key area for improvement when examining retail provision for older people. This outcome is supported also by the results of other studies (Hare, 2003).

The promotion of multi-purchase products is not beneficial for older people who live alone or in smaller households. Many customers complain they do not want two of the same item; just one. Despite this most supermarkets favor such special deals.

Product and pack sizes do not meet older consumers´ needs, as they contain more food than is required and suitable for two-person households or for seniors who live alone. Current quantities are focused towards larger families; they do not meet the needs of older people. To improve the situation, food quantities should be smaller in terms of portion size and pack.

Product relocation also causes confusion among older people. Positive experiences arise if the store makes it easy for consumers to find the product they are looking for.

Shelf height, store size and food labelling have been identified as problem areas for older people when shopping for food.

Based on the factor analysis the research indicated three general factors, namely convenience of shopping, value for money and product related attributes to be crucial in terms of seniors´ shopping satisfaction. Our findings demonstrate that there are still more areas for retailers to improve the service for the growing seniors population. As a consequence retail managers should respond to the needs of older people in altering shelf height, increasing in-store seating, informing customers of product relocation changes, minimizing the use of multi-purchase promotions, reducing the product and portion size of food and improving food

labelling with increased font size and adequate color. It is in the interest of the retailers to resolve the negative factors and improve the positive experience.

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Consumer habits of food supplements from the perspective of food safety

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Abstract
The topicality of the subject has been shown by the fact that the number of food supplements has been increasing in the last few years. These products are different from the traditional food products and the risks associated with them may also differ from the traditional food risks. On one hand, the typical food risks still apply; on the other hand dietary supplements can have significant nutritional risks since they contain special ingredients which may be dangerous if they are not consumed properly. Meanwhile, on the market customers are given significant amounts of information about food supplements, but this information sometimes can be misleading and may influence consumer habits.
The aim of our research therefore is to examine the consumption patterns of adult dietary supplements users, highlighting some of the determinants of food safety as well, such as quality, availability of information and risks.
Within the framework of primary research, focus group interviews were conducted and a survey was also used. Based on both the focus group and the survey results, it can be seen that uses of food supplements are judged differently by the respondents.
In data processing, factor- and cluster analysis were used to segment consumers based upon how they consider the use of food supplements. Four homogenous groups were identified among the respondents on the market of food-supplements and the research examined which consumer characteristics were applicable to each group.

Keywords: *consumer behaviour, segmentation, information, quality, risk*

JEL Classification: *Q1, M31*

1. Introduction

According to different surveys, in Central Europe the average life expactancy and health condition of people are worse than the average of the EU. Thus, health conscious behaviour and nutrition play an important role in health protection.

As a result of a change in living conditions, people being in constant stress, not doing enough physical activities and living in polluted cities need vitamins, micro- and macroelements with greater effects. Eating habits have changed; there are plenty of ready-to-eat meals that often do not contain necessary nutrients. Nowadays, it is not enough to consume traditional foods only. Food supplements are those products that can supply us with essential nutrients. Customer needs and expectations toward products are changing rapidly. This applies to food supplements as well. These changes should be taking into acount in the process of innovation. The most important factor in a succesful marketing strategy is the knowledge of consumer and market habits.

1.1 The market of food supplements

In the last few decades there has been a significant change in the use of health care products. The interest towards natural things has increased. Besides, alternative medical trends, methods of

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treatment have started to strengthen. It turned out, that herbs, animal and mineral materials are important, not only because they contain necessary nutrients, but also because they have special effects that can be used in disease prevention. Due to this, different types of non-medicine products have appeared all over the world and they have become known as phytoterapical products, functional food or food supplements.

Functional food consumption is increasing in almost all industrialized countries. Interest in functional foods and drinks has been fuelled by a desire for convenience, as well as health. Frewer et al. (2003) pointed out that the development of functional foods will continue to grow in industrialized countries, fuelled by increasing life expectancy, higher prevalence of non-communicable diseases, increasing healthcare costs and the acceptance of the strong link between diet and health. Consumers, however, remain somewhat wary about health-related claims on food and drink products and sceptical of their efficacy. Therefore, success in the functional food market is increasingly dependant on establishing a relationship of trust with the consumer.

In literaure, there are many possible definitions for the term 'functional food', but so far there is no global consensus on its meaning. The term was first used in Japan in the 1980's for food products fortified with special constituents that possess advantegeous physiological effects. Functional foods may improve the general conditions of the body and decrease the risk of some diseases. The japanese interest for functional food has brought awareness for the need of such products in places like Europe and the United States. Experts in these countries realised that besides being able to lower the cost of healthcare of the aging population, functional food might also give a commercial potential for the food industry (Siro, 2013). This new category of products also bring science and high technology into everyday life by promising certain health benefits (Niva, 2007).

The definition of food supplements according to European Commission Regulations[1] is: “as an addition to a normal diet, food business operators market food supplements, which are concentrated sources of nutrients (or other substances) with a nutritional or physiological effect. Such food supplements can be marketed in “dose” form, such as pills, tablets, capsules, liquids in measured doses, etc.”

In the last few years the market of food supplements has increased extremely. A general trend can be observed on health market: consumers tend to switch from Rx (medical prescription) to OTC (over-the-counter) products increasingly. Based on a literature review, prospects of OTC market seem to be good in future, however this requires the accurate understanding of constantly increasing consumer demands.

Globally, Western Europe and The United States are the biggest regions of OTC market - representing about 43% of the sales in the sector. However, the real drivers of the changes are South-East Asia, Latin America and the emerging countries of Central-Eastern Europe, especially the V4 countries (Figure 1.) As for the yearly change of the expenditure, the most significant development was taken by Russia and Poland (Tisman, 2010).

Tisman (2010) pointed out that growth of almost a quarter in the European OTC market recently had come from innovation. "So innovating to provide better products with additional benefits for which consumers are willing to pay more money is really the key". Tisman advised innovation

[1] European Commission: Food labelling and nutrition/Food supplements Retrieved: August 10, 2015 from http://ec.europa.eu/food/safety/labelling_nutrition/supplements/index_en.htm

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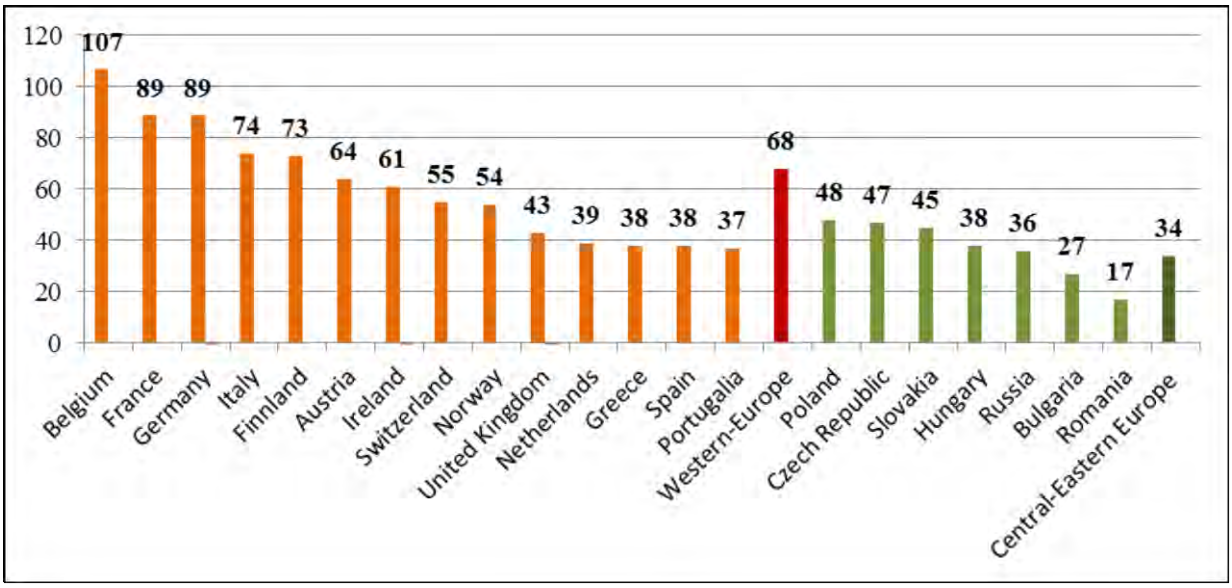
should be more than just product development. He emphasized: "the majority of innovations come from line extensions which probably are not adding huge benefits to the consumer". For example, social media is now present in consumers' daily lives, so it should be used better by consumer health care. As well as innovation is dosage or delivery technologies also could add benefits to customers.

Figure 1: OTC expenditures per capita in the European countries, euro



Source: Tisman, 2010

Siro et al (2013) however emphasized in their study that the development of functional food products is "rather complex, expensive and risky" as special requirements should be answered. In product development, attention should be paid both to consumer demands and technical conditions, as well as the legislation background.

1.1.1 Marketing of food supplements

The food industry is one of the most important branches of the national economies in the European Union, playing a central role for the processing of agricultural raw materials and food supply. In this industry, innovations are recognized as an important instrument for companies belonging to the food industry in order to stand out from competitors and to satisfy consumer expectations (Brigliardi et al, 2013). Markets for this cateory show intense competition and in order to survive, companies must carefully plan new product processes. This competitive atmosphere suffers from a lack of information and understanding of consumer attitudes and behaviour and this could lead to poor market acceptance (Verbeke, 2005).

The number of companies producing and distributing health care products has been continously increasing. The available range of products is very wide, at rather different price levels. In many cases customers - in the hope of healing - are willing to pay exta for food supplements.

The most frequent forms of advertisments of health care products are: paid advertisements, leaflets, other promotional tools, direct mail, electronic media advertisements, information via Internet, professional events, conferences.

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Food supplements can be purchased through multiple sales channels; typical places: pharmacies, drugstores, hiper/supermarkets, shops, Internet, MLM. Among distribution places pharmacies represent the top level of distribution. Network of pharmacies can cover the whole country, they operate under strict regulations with a highly qualified expert team. Pharmacist can give high level of information during purchase and can help with choosing the right and safe product. Drugstore is another important segment of sale where sales staff usually hold a qualification of commerce. In the case of hiper-, supermarkets, it can be a problem that there are no professionals giving information on products. A patient can only rely on her own knowledge.

With the spread of webshops, the range of products that can be purcased on Internet has been expanding. Nowadays, we can easily order food supplements, cosmetics as well as medicines from home. Purchases in other places (MLM, network of brokers, markets, telephone orders), however can be sometimes dangerous. The origin of these products is uncertain, the ingredients are unknown and they usually do not hold an authentic label.

In literature, the research techniques of consumer behaviour have spreaded to most in functional food researches (Gilbert, 1997; Menrad, 2003; Verbeke, 2005). Gilbert (1997) examined the specific demographic segments in her study and their attitudes towards health, nutrition and functional foods. She defined the segment of "Food as medicine" shoppers as the main consumers of functional food. Menrad (2003) studied how knowledge of ingredients influence the acceptance of functional food, and to what extent they are willing to pay price premia.

Childs (2002) described the typical american functional food consumer as: "elite, educated and well-informed". Whereas, Verbeke (2005) describes the typical functional food user as „benefit believers who faced illness among relatives and whose eventual criticism towards functional food information fades away with ageing”.

Wansink et al (2005) examined the consumer behaviour of functional food on the basis of the hierarchy of nutritional knowledge. The first level is: "No knowledge", the second is: "food specific attribute knowlegde", the third level is: "consumption consequences knowledge" and "consumption".

Black and Campbell (2006) asessed the ingredients of functional food consumer behaviour on the basis of food-choice model of Khan (1981). Szakaly et al (2012) revealed the relationship between lifestyle, health behaviour and the consumption of functional food on the basis of Grunert's food-related lifestyle model. By the authors, different lifestyle segments were defined: the rational, uninvolved, conservative, careless and adventurous consumer segments. Among these, consumers with a rational approach provide the primary target group for the functional food market.

2. Data and Methods

To base our research, we used focus group interviews as a qualitative technique. The group discussion was conducted twice - with 6-6 persons in each - to identify trends and patterns in perceptions. The results provide clues and insights as to how a product is perceived by the group (Table 1.).

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Table 1: Demographic composition of participants in focus group interviews, person

Educational level	Age				
	18–29	30–39	40–49	50–59	60 yrs +
Basic level	0	0	0	0	2
Intermediate level	1	2	0	1	2
Higher level	1	2	1	0	0

Source*:* Own research, 2014

Criterias for participation in the group: the age of 18 or above and earlier experience in the use of food supplements. A total of 12 individuals participated (3 men and 9 women) in the interviews.

In the quantitative technique, online survey was used as the main primer method. 280 survey were sent by email and 104 were successfully completed and returned. The response rate in adult men and women was 37,14% in the research.

The following table shows the definition of target population of the survey.

Table 2: The definition of target population

Basic file (population)	Unit of sampling	Geographical area	Period of survey	Sampling frame
The adult population of Hungary (women and men, 18 yrs+)	Individuals	The area of Hungary	August-September 2014	Predefined list of individuals (database with names and email addresses)

Source: Own research, 2014

280 survey were sent by email and 104 were successfully completed and returned. The response rate in adult men and women was 37,14% in the research. As a research tool a standardized questionnaire was applied. Questions were grouped around 4 main topics:

1. Attitudes toward health and healthy lifestyle.

2. Consumer judgement of the use of food supplements.

3. Consumption patterns of food supplements.

4. Factors influencing purchase decision; especially

• quality;

• information and

• risks.

The applied sampling is convenience sampling, thus it may limits generelizibility. The survey was carried out in August-September 2014, in Hungary. SPSS statistical softwer was used for data processing and MS EXCEL for presenting the results.

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3. Results and Discussion

Participants in focus group interviews shared similar opinion about health and healthy lifestyle. From the factors that can determine healthy lifestyle, participants emphasized the importance of healthy nutrition. They agreed that in healthy nutrition diversity is the key. Participants also agreed that there can be different situation in life when the use of food supplements is unavoidable.

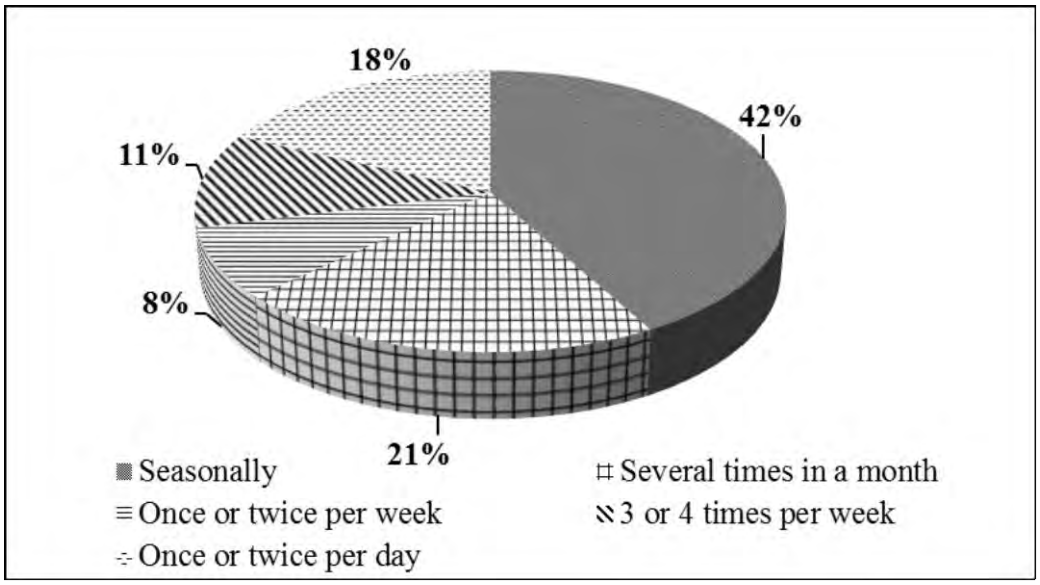
Data from the survey results show that respondents feel protection of their health is rather important (4,58 average). It can also be seen from the results that consumers pay attention to the quality of food (3,97). They are willing to pay extra money in order to protect their health (3,67) and are willing to apply health care products (3,61). Respondents pay attention to their family nutrition moderately (3,06). Doing regular physical activity usually is not applicable to them (2,30).

As for the motivation of food supplement consumption, the most frequent reason of consumption is vitamin supplement, followed by health protection and than attractive appearance. Treatment of diseases and pregnancy were choosen less by the respondents.

In our paper, we studied the correlation between gender and the motivation factors and we have found that 43,7% of women choosed health protection as their main motivation (p = 0,0). Around 41% of men and 33% of women choosed vitamin supplement as the reason of consumption. Attractive appearance was choosed by 19% of women and only 3% of men. (p = 0,02).

As for the consumptiom patterns of food supplements, most of the respondents use food supplements seasonally (42%), followed by the customers who consume such kind of products several times in a month (21%). 18% of respondents use the products daily and 11% consume food supplements relatively freqently (3 or four times in a week). Finally, 8% of customers use them once or twice in a week (Figure 2).

Figure 2: Freqency of consumption of food supplements, percent



Source: Own research, 2014

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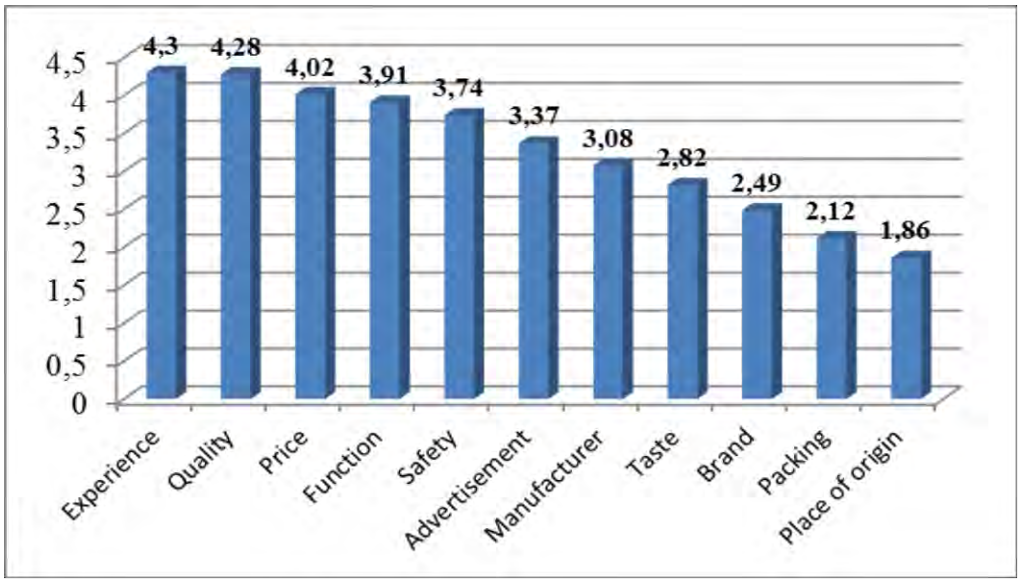
We examined whether there is a relationship between the different motivation factors and the freqency of consumption. We founded that there is a significant relationship between health protection and the freqency of consumption: those customers, who has choosen health protection as a main motivation, they tend to consume food supplement more freqently: once or twice per day (18%), several times per month (21%) and 3 or 4 timer per week (11%). Those customers who comsume food supplements for the reason of vitamin supplements consume these products sesonally; whereas those customers who want to be attractive use the products once or twice per day.

Among factors that influence customer decision making, experience in earlier food supplement consumption received the highest value (4,30), followed by quality (4,28) and price (4,02). Other influencing factors, such as function, manufacturer, safety, taste or brand affect consumer behaviour less (Figure 3.)

Figure 3: Factors influencing food supplement consumption on 1-5 range scale, based on the average of the answers



Source: Own research, 2014

Figure 4 shows the most important sources of information. Respondents believe that the opinion of healthcare professionals (doctors, pharmacists) is the most authentic, followed by sales persons, and then articals and tv/radio programmes connected to the topic. Costumers obtain information from the acquaintances moderately. Examining the question on basis of gender, 94% of women and 56% of men listen to health care professionals completely. Whereas, 44% of men and only 3% of women mostly accept doctor's and pharmacist's advice.

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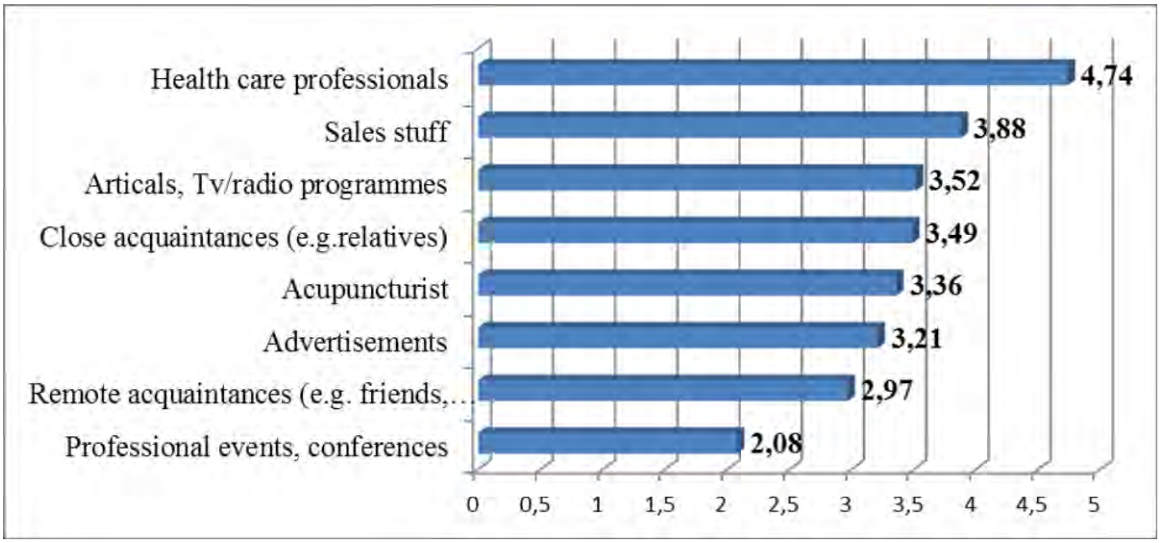
Figure 4: The most important sources of information in the case of food supplements, based on the average of the answers



Source: Own research, 2014

In our research we examined how customers judge the characteristics of food supplements. To measure respondents' attitude we applied a 1-5 range Likert-scale, where "1" means customers strongly disagree with the particular statement and "5" means they strongly agree with the statement. Statements that have received the highest rates are as follows:

Food supplements can be purchased without a prescription (4,63), They play an important role in disease prevention (4,59), They must be applied in specific doses (4,50), They supply improper diet (4,34).

Since respondents had to assess 12 possible answers at this question, in data processing our aim was to reduce the number of statements for easier legibility (Table 3.)

Table 3: Name and contents of the factors, Rotated Component Matrix

Name of factor	*Factor statement*	*Component*				
		1	2	3	4	5
F1 – consideration of health protection	K5_1. Food supplements supply improper diet.	0,77	–0,10	–0,02	–0,04	0,03
	K5_2. They play an important role in prevention of diseases.	0,72	0,29	0,17	0,04	0,14
	K5_4. They can be purchased without a prescription.	0,56	0,18	0,45	0,00	–0,05
F2 – factors of uncertainty	K5_7. You need a lot of inmformation for their use.	–0,21	0,75	–0,06	–0,19	0,20
	K5_8. There is no need for a permission for their distribution.	0,15	0,74	0,29	0,11	–0,03
	K5_12. Their unnecessary use can be dangerous.	0,32	0,68	0,04	0,09	–0,23
F3 – knowledge of ingredients	K5_5. They migh interact with other medicines.	0,00	0,01	0,84	–0,11	–0,24
	K5_6. They contain natural ingredients only.	0,32	0,28	0,61	0,25	0,37
F4 – importance of dosage	K5_9. They can be used without a doctor's supervision.	0,06	–0,12	–0,08	0,74	0,35
	K5_11. They have to be used in specific	0,40	0,42	–0,10	0,63	–0,26

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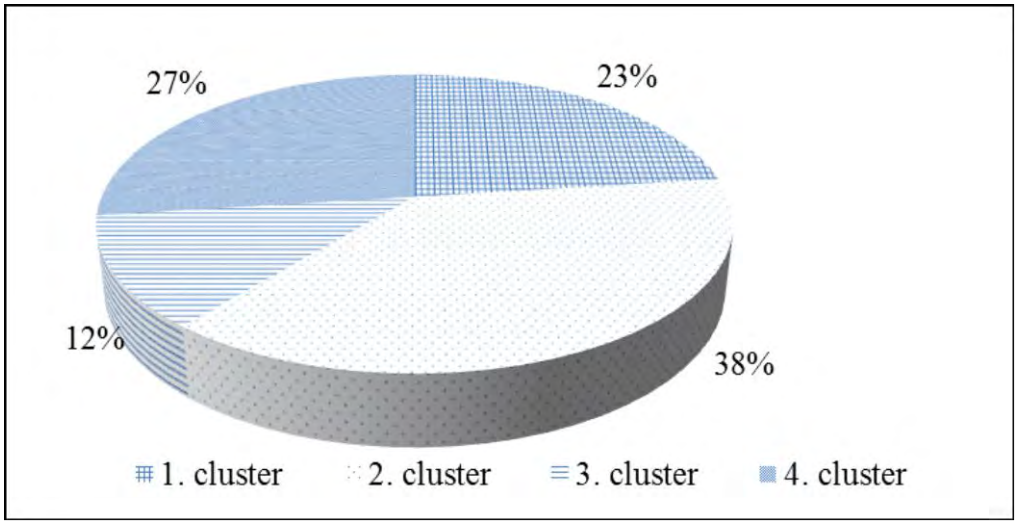
	doses.					
	K5_10. Food supplements are costly.	–0,42	0,00	0,12	0,60	–0,06
F5 – perception of necessity	K5_3. Everybody needs these products.	0,08	–0,02	–0,12	0,07	0,85

Source: Own research, 2014

We have classified the respondents into homogenous groups by the help of variables that were generated during factor analysis. 104 cases could be included in the analysis. Clusters contain 24, 40,12, 28 elements respectively in a 4-cluster-solution (Figure 5).

Figure 5: Distribution of respondents in the four cluster, percent



Source: Own research, 2014

The clusters were characterized by the analysis of clustercentroids, i.e. we defined the average of the factor within each group and we have made our conseqvencies to the specic group. We have characterised the generated groups by demograpfic variables as well. Based on chi-square test, we studied the relationship between cluster membership and the following variables:

- gender (P=0,004): significant
- age (p=0,11): no significant
- qualification (p=0,0): significant
- location (p=0,281): no significant
- marital status (p=0,173): no significant relationship.

In the case of each segment, we also identified the elements of marketing-mix. In summary, the four segments can be described as follows:

Cluster 1 – the segment of Cozy customers contain those customers, who consider health protection very important, but who are tend to do less in order to protect it. On the other hand, they are willingly use alternative health products. Customers of this group believe that everybody needs to consume food supplements. Most of them are women (80%); mainly from the young age groups. The main motivation for them is health conservation. Attractive appearance is another imortant motivation factor in this segment. In the consumption of food supplements, they are afraid the most that the product is not of a proper quality and they might overuse them. In order

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to avoid the risks, they usually choose those products that have already been tried by themselves or by their relatives and friends. One of the main characteristics of this cluster is that customers listen to their close or distant acqaintences' opinion.

Cluster 2 – Customers, belonging to the segments of Skeptics, think that their health is important, but - unlike Cozy customers - they live a more active life; however they tend to use alternative therapies less. Skeptic customers answered negatively to the questions regarding to health protection as well as safety. They considered the importance of necessity of food supplements negatively. In this group, men can be found mainly (65%), who are mostly over the age of 40. They purchase food supplements in order to vitamin supplements mostly. Customers of the segment are afraid that food supplements might cause allergy.

Cluster 3 – the members of Careful users seem to be rather careful in the usage of food supplements. It is very important for them to use these products carefully: they read the instructions and dosage thoroughuly, They take it into account that food supplements might interact with medicines. Their knowledge of ingredients is high. Gender ratio is well-balanced in this cluster. Consumers of this group have low income usually. A Members of the group consume food supplements for the reason of vitamin supplements mainly.

Cluster 4 – Conscious Health Protectors attach high importance to health protection: among all groups, they are most willing to act for the favour of their health: they do sports regularly; they pay attention to their own and their family members' health, and they tend to use alternative health products more than the consumers of the other groups. These are the customers who are less afraid of the risks associated with the usage of food supplements, than the members of other segments and also, they are most willing to spend money in order to protect their health. The main motivation for them is protection of their health. Gender ratio is well-balanced in this groups as well; members are usually middle-aged (30–50). In this cluster, consumers have usually high income and high qualification.

4. Conclusion

On the health market (and on the food supplement market) it can be observed that customers becoming more health-conscious and they choose carefully the food that they eat. This observation is supported by literature review and the results of our primary research as well.

Consumers of food supplements are motivated by different reasons and they attach different degrees of importance to the roles of these products. Based on the characteristics of the clusters and taking the elements of marketing-mix into account, our suggestions are the following considering each group:

Cozy customers: at this segment it is advisable to draw customers' attention how important it is to take part actively in the protection of their health.

Skeptics: marketing strategy should convince customers - even with the help of a health care proffesional, such as doctors and pharmacists - about how food supplements can contribute to their health and the prevention of diseases.

Careful users: companies must win the trust of these customers and have to give more detailed information on the products: either by developing proper instructions, either by the training of health care professionals. Regarding to the fact that members of this group can be influenced by

advertisements and customers often obtain information from magazine articles and TV programmes connected to the topic, companies should use these tools to send their messages to the customers. In marketing communication messages should emphasize safety. On the other hand, members of this group are price-sensitive and this means that discounts also could draw customers' attention to the products.

Conscious health protectors: have got a wide range of knowledge on health care topics and they believe it is important to be active in order to protect their health. For these customers, quality is extremely important, thus the main aim in defining the right marketing strategy could be developing products with high quality. High quality should be emphasize in communication. Since, members obtain high educational level and income, their expectation toward food supplements may be high as well.

Therefore, it is advisable to pay attention to other characteristics of the products: such as packing. With the extention of selection (producing different tastes) companies could increase their turnover in this segment.

We conclude that - although the sample is not representative - the results can give a good base for the conduction of a further, advanced level of research. Besides, we have found the results to be useful in understanding how people hold certain beliefs about food supplements. Findings can also improve the innovation of new products that suit better to costumers' unique needs. Since small and medium sized companies are more flexible than multinational companies, they are advised to develop niche products. Segmentation can help SMEs to define the right Niche marketing strategy in order to succed among the strong competition relations of food supplement market.

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The atmosphere and its impact on consumer behaviour in food stores

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Abstract
Today´s fast paced times, which brings constant changes in fashion trends, technological innovations but also transformation of lifestyle itself, forces retailers to continually adapt to these facts. Innovations and changes of this kind are more than necessary. Whether it is the need to maintain the attractiveness of the store in the competition of new operations with similar focus, or it is a necessity to implement some changes to update the technical infrastructure and reduce operation energy consumption. Functionality of retail operation has to do largely with its architectural and design solution that the customer must first reach and attract to the store, and then motivate them to purchase. Even shopping atmosphere has recently become more important. Many stores are based on the fact to have the most comfortable atmosphere that forces the customer to stay in the store as long as possible. Sellers are also trying to make from the shopping an experience. It is necessary that the customer feels in the store satisfied. Just shopping atmosphere and its control could help to higher customer satisfaction. It is therefore very important to monitor the fundamental factors that affect the atmosphere in the store. The paper deals with the examination of selected elements of the shopping atmosphere and its impact on consumers in grocery stores operating in Slovakia. Research integrates the questionnaire survey and observation in real terms of selected retail operations. Based on the findings we suggest in paper conclusion proposals concerning the adaptation of selected factors affecting the atmosphere in order to improve the overall well-being of customers and hence their satisfaction during shopping.

Keywords: *customer, lighting, shopping atmosphere, smell, sound*

JEL Classification: *M31*

1. Introduction

Meaning of Visual Merchandising in a Stores

Visual merchandising is the art and science of presenting products in the most visually appealing way. It is also "language of a store", how a retailer communicates with its customers through product images or presentations (Kerfoot, Davies and Ward, 2006). A more sophisticated visual merchandising strategy can lead to even greater effects, achieved by directing shoppers 'attention to specific products, triggering unplanned purchases, and establishing a uniform picture of the store (Ebster & Garaus, 2011). Pegler (2011) present in the food category, the sale through real stores is still the most widely concept of selling. For most people today, the shopping is not just a business to meet the primary needs but also the possibility of spending their free time. Law, Wong and Yip (212) present, visual merchandising has come to describe not simply the means by which information about the product/ services is communicated but how the message is received by the customer in a way that stimulates their senses and motivates them to buy (Iarocci, 2013). Visual merchandising is concerned with the creation of a store environment which, on the one hand, consistently represents the values of the retailer and their brand to consumers and, on the other, satisfies the needs and expectations that the consumer has of the retailer (Fernie & Fernie & Moore, 2015). According to Berčík and Horská (2015) the purpose of visual merchandising is at once

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both to convey the retailer´s corporate positioning to the market and to reflect the aspirations of prospective customers.

Store Atmosphere in Food Stores

(Ebster & Garaus, 2011) The commercial structure in recent decades has dramatically changed, while dominant sale formats are no longer small shops but the supermarkets, hypermarkets and large shopping centers. To be succeed in the market today for commercial operations very difficult, and therefore must continuously improve and provide products with the required quality, reasonable prices, quality service and memorable atmosphere for the buyers (Spies, Hesse and Loesch, 1997). According to the Prague and Hal (2002) the result of action of the shopping environment and its quantitative (number, size, volume) and qualitative (layout, organization, appearance) characters on the senses. According Zamazalová (2008) shopping atmosphere can have a big impact on how customers perceive the retail unit and may also decide which units you choose. (Bhalla & Anuraag, 2010) The choosing of a particular retail chain is subject to certain stimuli that elicit the consumer´s thinking kind of emotion. Ebster and Garaus (2011) presents, the incentives are perceived by the customer through the various senses. (Summers & Hebert, 2001) being examined in our contribution as sight (light), hearing (sound) and smell (smell in the shop). Lamb, Hair and McDaniel (2009) define; lighting can also have an important effect on store atmosphere. Horská & Berčík (2014) Consumers often are afraid to shop after dark in many areas and prefer strong lighting for safety. Store atmosphere has usually been included as a component of store image, along with other physical in-store variables, than it has been conceptualized as a single attribute, often with some vague single dimensionality such as "good" atmosphere. The last, store atmosphere has been studied as one factor influencing the consumer´s general decision to patronize the store, but no detailed investigation has been made of how store atmosphere affects shopping behavior within the store (Donovan, Rossiter, Marcoolyn, Nesdale, 1994).

2. Data and Methods

In order to obtain information about the perceptions of the atmosphere in terms of retail lighting, sound and smell operation as an important factor in the selection of retail stores managing in Slovakia, we realized a questionnaire survey with random buyers. The sample consisted of 120 respondents, while 6 questionnaires had to be excluded on grounds of incorrect fillings, which means that the sample was reduced to 114 respondents. The exact structure of the sample is shown in Table 1.

Table 1: Structure of Addressed Respondents

Gender/ Age	18 - 24 years	25 - 49 years	50 - 64 years	65 and more
Men	18	21	11	2
Women	28	23	6	5
Together	46	44	17	7

Source: own research

The research was conducted in stores mostly in western Slovakia in different sales formats (small food store, supermarket, hypermarket and discount). Subsequently, the 43 stores of different formats always made the same purchase of five items (1 pc milk, 1 pc of white wine, 1 pc of bread, 2 pc of chocolate, 5 pc of apple) in order to measure the time needed for shopping. The processing of collected primary data was done with descriptive (frequency, percentiles, average) and inductive (Chi-square test contingency square) statistics. Rimarčík (2015) presents this test verifies that the differences may be actual and expected frequencies

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only random (variables are independent) or are too large to be merely accidental (there is no relationship between variables).

The hypotheses in this test are following: H0: Quantities are independent.
H1: Quantities depend.

In the paper two assumptions have been determined and verified:

- We assume that there is a relationship between gender and preferred stores with more pleasant atmosphere.
- We assume that there is a relationship between age and preferred stores with more pleasant atmosphere.

3. Results and Discussion

According to Kotler (2007) each store gives a certain feeling, one store is crowded, second is charming, and third is luxury and fourth boring. Therefore, every business must have a coherent atmosphere to match the target market and encourage consumers to shop. In the current issue of the visual attractiveness of the retail chain belongs the inherently lighting of stores. Appropriately selected type, color and intensity of light have an impact not only on the attractiveness of the sale itself, but it can positively or negatively affect the mood of buyers. Furthermore lighting can visually separate each department stores (especially in larger commercial formats) or shape the way the display of goods in the store. For example, Štetka (2015) states that the interpretation would be used halogen lamps in order to raise attention and desire for goods in interpretation. It should also be ensured that the lighting was not weakening, so the emergence of a negative feeling of darkness. While lighting helps the image of retail, but must take into account economic considerations in terms of energy savings. Appropriately selected type, color and intensity of light have an impact not only on the attractiveness of the sale itself, but it can positively or negatively affect the mood of buyers. Furthermore lighting can visually separate each department stores (especially in larger commercial formats) or shape the way the display of goods in the store. For example, Štetka (2015) states that the shop window would be used halogen lamps in order to raise attention and desire for goods in interpretation. It should also be ensured that the lighting was not weakening, so the emergence of a negative feeling of darkness. While lighting helps the image of retail, but must take into account economic considerations in terms of energy savings. The sound system is another major factor in sensory marketing, which creates the overall atmosphere in the shop. Its stimulus is perceived through the senses, a hearing. This factor of atmosphere could just as light and scent to influence customer experience in store visits. According to Štetka (2015), the store can reduce perception of waiting time by cash desk, to distract customers to create the image of business operation. The use of music helps the customer to satisfy, thus slowing down and thus spend more time in the shop and forget the rush. According Vysekalová et. al. (2011), the music plays in any commercial operations must be selected to suit the tastes of most customers. Musical preferences are based on age, education, social and economic status in society. According to Franěk (2002) may be poorly chosen background music to the customer to send a signal that he found himself in a place where it does not. The most common musical background in Slovakia is pop and rock. In a business environment background music composed of these genres that can override annoying traffic, however, if the customer is not focusing directly on the listening, it does not register, says Mikula. An important factor influencing customer behavior in the commercial operations inherently includes the fragrance in the store. The pleasant smell can keep the customer in the store longer, can positively influence their desire for their product and customers are even polls by then willing to pay more, says Boťanská (2015). In connection with the scent, however, care must be taken in the correct functioning of retail space ventilation via air

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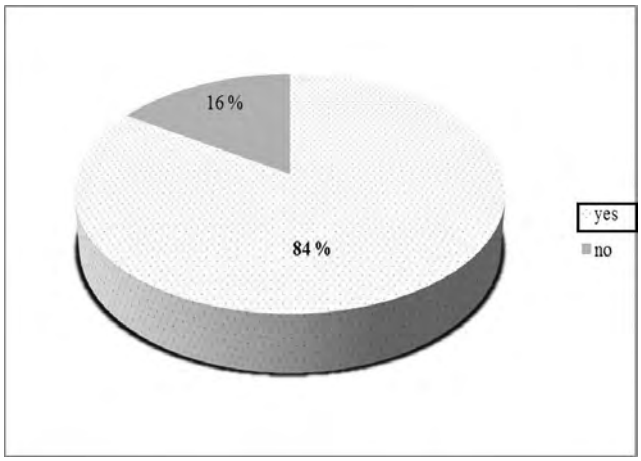
conditioning. If we were to appoint other factors that could be considered to be factors constituting the overall atmosphere of the shop, an essential part of it was the overall retail climate under which we mean air temperature.

In the following part, we focus on the results of our own primary research, which was conducted at the end of 2015 on a sample of 120 respondents, mostly from western Slovakia. From the results of the questionnaire survey shows (Figure 1 and Figure 2), the respondents perceive the atmosphere in food stores regarding selected elements (lighting, sound, smell) very positively in 84 %, just 76 % of them has the effect of these elements by their shopping. However, we expect that this percentage is even higher, since the individual elements we often perceive only unconsciously.

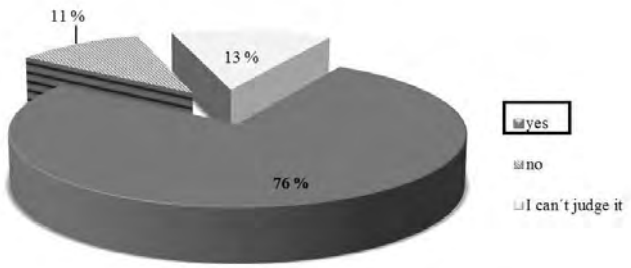
Figure 1 The perception of atmosphere in food stores in terms of lighting, sound and smells



Source: own survey

The effects of store environmental elements could be complex. In the context of retail store, atmosphere refers to aesthetics or ambiance of the store. The atmosphere cues such as color, music, lighting, smell, crowding, windows display and storefront reflect the store atmosphere and play an important role in shoppers´ perception and evaluation of the store at large. While many of these elements influence shoppers' behavior through their effects on shoppers' emotion, cognition and physiological state, some of these elements could elicit more direct response from shoppers with very little impact on their thinking, feeling or body comfort.

Figure 2 The influence of the atmosphere in food store (lighting, sound, aroma or quality of air) on consumer behavior



Source: own survey

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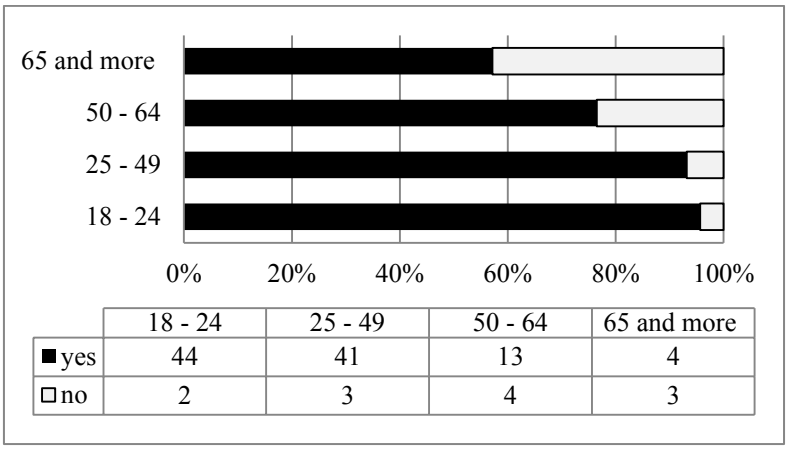
The atmosphere in food stores has an influence in the following of lighting, sound, aroma or quality of air on more than 76 %. 13 % respondents assume that the atmosphere doesn´t influence on them and just 11 % cannot judge it. Recognizing the significant impact of store environment on consumer behavior, retailers devote considerable resources to store design and merchandise presentation activities. The pleasant environments encouraged consumer to stay longer in the selling environment and to make unplanned purchase. In addition to assessing the views of respondents we have also focused on the analysis of pre-established hypotheses. At the first hypothesis, we assumed that there is a relationship between the gender of the respondent and preferred stores with more pleasant atmosphere. The difference in preference of gender is shown graphically in Figure 3.

Figure 3 The relationship between gender and preferred stores with more pleasant atmosphere

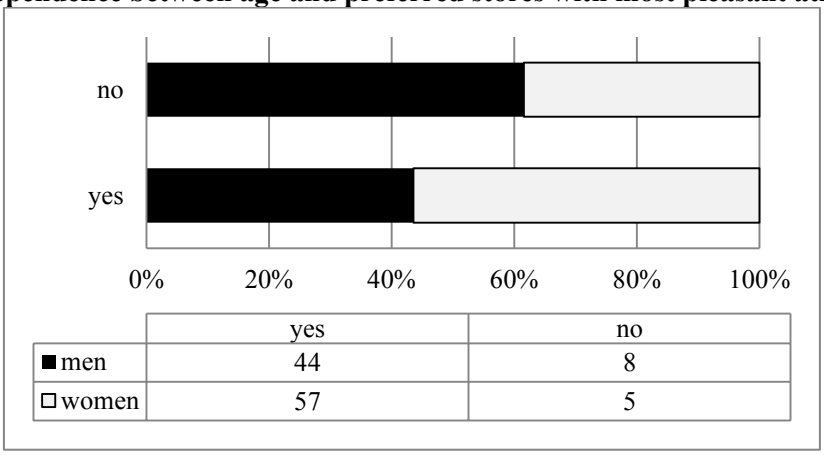


	18 - 24	25 - 49	50 - 64	65 and more
■ yes	44	41	13	4
□ no	2	3	4	3

Source: own survey

This dependence was verified using the Chi-square test of independence at a significance level of 0.05, with the hypothesis about the dependence of those attributes confirmed. Also, we wanted to verify whether related to age of the respondents favoring stores to see much better atmosphere (Figure 4). In this case, depending on the attributes of the hypothesis test for the significance level of 0.05 using Chi-square test confirmed.

Figure 4 The dependence between age and preferred stores with most pleasant atmosphere



	yes	no
■ men	44	8
□ women	57	5

Source: own survey

Based on the evaluation of the overall impression of the individual elements (sound, lighting, scent) shopping atmosphere (Figure 5) can be seen that the most positive, assessment on the basis of average values of lighting. Here it must be observed that the evaluation interviewed was largely differed as evidenced by the rather broad ranges. On the contrary, based on the average of the responses received it indicates that air quality and flavor in these stores the majority of respondents assessed as less pleasant.

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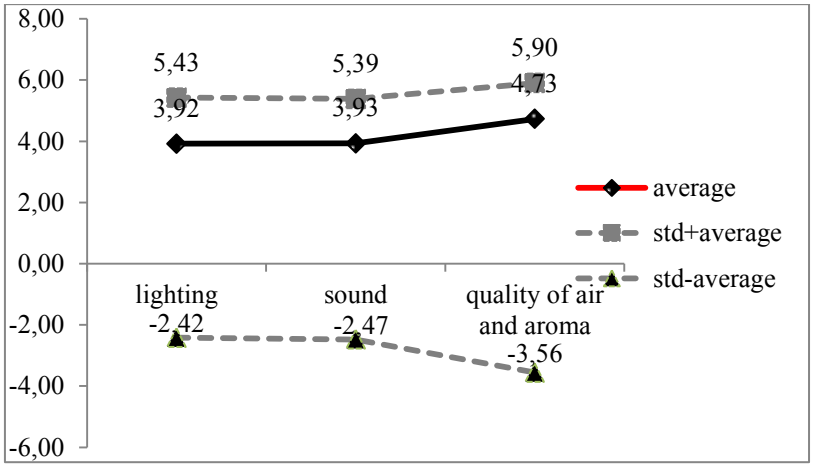
Figure 5 Aassessments of the overall impression of the individual elements (sound, lighting, smell)



Source: own survey

4. Conclusion

A strong competitive environment is forcing all businesses to differentiate themselves from the competition and thus place them in the minds of its customers unmistakably. In the case of commercial operations is to serve the actual shopping atmosphere. To create it contributes various elements of which we in this paper focused on lighting, sound and smell in the food shop. The right combination of these elements can attract customers and, at best, causing him to be selected to recurring operations, which is the goal of any business unit. Even though we live in the age of the Internet in a variety of foods in-store purchases, it became the dominant form, and therefore review and continuous improvement of the various visual elements is justified. This is not about aesthetics but also economic, as ever. Correctly chosen lighting outlets can bring considerable energy savings. In addition to an appraisal of the attractiveness of retail today also contribute to a number of new technologies that will be the subject of our further research. The respondents perceive the atmosphere in food stores regarding selected elements (lighting, sound, smell) very positively in 84 %, just 76 % of them has the effect of these elements by their shopping. The atmosphere in food stores has an influence in the following of lighting, sound, aroma or quality of air on more than 76 %. 13 % respondents assume that the atmosphere doesn´t influence on them and just 11 % cannot judge it. Depending on the attributes of the hypothesis test for the significance level of 0.05 using Chi-square test confirmed, there is relationship between gender and preferred stores with more pleasant atmosphere. The most positive assessment on the basis of average values is lighting. These trends influence the customers in the food stores could be measured by modern survey techniques used in neuroscience too.

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Prosumer attitudes as a new component of consumer behaviour on the food market

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Abstract
The main objective of the study was to identify signs of prosumer attitudes of food products consumers. In recent years a dynamic changes in consumers behaviour has been observed. Consumers of the XXI century are active representatives of the demand side, who find themselves quite comfortable in an extensive world consumption. They also turned from the passive clients into a well-informed in the market offer consumers. The increase of knowledge and consumers awareness is the result of the rapid development of technology, in particular common access to the Internet. Consumers also engage themselves in cooperation with the producers. Active attitude of the consumers to co-creation of the market offer nowadays is defined as the phenomenon of prosumption. Consumers, previously passive recipients of the product manufactured by the company, take over part of the product development process on themselves. On the other hand, producers through communication with consumers, encourage them to introduce their ideas. An important aspect of accompanying these relations is a partnership cooperation.

Key words: *consumer behaviour, food market, prosumption*

JEL Classification: *D10, D19, M39*

1. Introduction

The term prosumption arose from the combination of the words: production and consumption, and is a phenomenon of interpenetration of these two processes (Jung 1997). The concept of prosumption was first used by an American sociologist and futurologist Toffler (1997) in the scientific publication "The Third Wave". The author explained this phenomenon as the movement of the production process from manufacturers towards the consumers. According to Toffler prosumption is a phenomenon characteristic to the third wave of social development. In the wave of agricultural society, prosumption might have been identified with the production and consumption of food by farmers for themselves. In the wave of the development of the industry, the consumers departed from producing goods for themselves, by using the commercially available system of exchange. Consumers of the third wave undertake cooperation with the producers, by which they can have an impact on the market offer.

According to some authors (Hajduk & Zalega 2013, Mitręga 2013) the phenomenon of prosumption, although present in the literature for the past 30 years, only recently caught the attention of the researchers. In addition, a large gap in the conceptualization and in the measurement of the phenomenon complicates the creation of a commonly accepted definition. As stated by Ritzer (2014), the very notion of prosumption remains niche and still not very popular. It is associated, among others, with the dominant manner of perceiving and describing the economic and social world, as a combination of two separate spheres - production and consumption.

By grasping the phenomenon of prosumption quite widely, it can be defined as any activity undertaken by the consumers consciously aimed at increasing the value associated with the

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purchase and use of the product (Mitręga & Witczak 2012). The tendency of consumers towards prosumptive behaviours is based on a particular state of mind (the cognitive and affective sphere), but the prosumption alone is expressed in the behavioural sphere (Mitręga 2013). Prosumption is a result of an expansion of individualism and the regress of massive production and provides a way of consumers' expressing their own "self" (Sowa 2015).

Prosumption is quite a diversified phenomenon. In a general manner, it can be divided into two types. The first is exhibitionist prosumption, expressed through an active participation of the consumers in the processes of customization of the products. The second type is rationalist prosumption, which consists of reducing the cost of the purchase and the usage of products. It occurs when the buyer independently performs some conventional actions attributed to the manufacturers or the retailers (e.g. packaging, transport, registering of goods) (Mitręga 2015).

As noted by Tapscott and Williams (2008), contemporary prosumption must be linked to providing the consumers with the appropriate tools which allow them to influence the offer of the companies. Moreover, cooperative partnership and sharing of benefits must occur between these two groups of market actors. Fisk (2009) indicates that in the process of engaging the consumers to cooperate with the company, four stages take place:
- co-determination - encouraging end-buyers to participate in the projection, creation, sharing ideas for products and services by means of various methods and forms, e.g. contests, innovative programs,
- co-design - understanding the expectations and consumer preferences, the ability to recognize their emotions and behaviors, as well as the creation of tools and instruments, through which the final buyers will be able to present their solutions and ideas,
- co-development - enabling the consumer to make decisions, raising awareness about the need to find a compromise and the issues concerning the dissemination of the manner of resolving a number of dilemmas, e.g. regarding the payment method or the maintenance service,
- co introduction - resolving particular issues relating to the introduction of the product into the market combined with actions such as promotional campaigns, support programs, etc.

Prosumers may be perceived as kind of external employees of companies who constitute their innovative potential and influence the competitive advantage (Mróz 2010). But above all, prosumers are competent and active consumers (Flis 2014). According to Domańska (2009) a person who is a prosumer is characterized by certain behaviors, which include becoming familiar with the opinions of other buyers before making a purchasing decision, describing brands and products on the Internet, co-production of products, slogans or advertising campaigns by participating in various promotions. Primary indications of the development of prosumer attitudes are (Kall & Sojkin 2008):
- changes in the area of the buyer’s values, which is expressed the consumer's need for greater participation and activity in the development of the product offer,
- growing criticism of consumers in relation to pseudo-innovations resulting from their knowledge,
- increasing competition on the market and product assimilation, which makes the manufacturer offer buyers a unique and often individualized benefits in order to gain competitive advantage,
- popularization of technologies enabling the consumer to co-produce the offer,
- increasing area of interactivity media which enable the manufacturer an appropriate use of competence and experience of buyers, which in turn promotes the formation of prosumer attitudes and behaviours,
- consumers’ model of spending free time focused around homes,

- changes in the labor market, which involve bringing the official duties to home and maintain contact with the company via the Internet.

Although the prosumers are a very diverse group, yet some features are common to all buyers showing these attitudes, primarily the openness towards innovation and commitment. Prosumers are proud of the fact that they are not afraid to experiment and they think for themselves. They are eager to talk about their own experiences with new products, but are also keen on hearing about others' experiences. They are opinion leaders; other people value their point of view and advice given. Moreover, prosumers are characterized by skepticism, since, although they appreciate the media and advertising as a source of information or entertainment, they do not take the media uncritically (Zmierzch konsumeryzmu era prosumentów 2005).

Prosumers wishing to match the new product to their preferences better are inclined to actions that were previously reserved only for the producer. Yet, the manufacturer allows the consumer to participate in the process of creating a new product through the implementation of a part of the process of value creation (Staniszewski 2009). Depending on the degree of the consumer's involvement in the company's operations three types of prosumers may be distinguished (Szul, 2013). The first group consists of active consumers, whose involvement is nonetheless limited only to the assessment and evaluation of products on the internet forums or the websites of the stores. The second group consists of the prosumers participating in activities which purpose is to make the offer more attractive as well as the prosumers taking part in the campaigns prepared by the companies. The third group constitutes the innovative prosumers, who exhibit the aforementioned actions and try to influence the companies' offer by themselves.

The approach leading to the transformation of the consumer from a passive recipient of the offer into its active wizard is derived from the concept of holistic marketing. Of course, not every consumer has the creative potential allowing for his incorporation into the process of creation or the skills enabling a clear and transparent communication of his expectations to the manufacturer. Therefore, the manufacturer ought to strive to develop the competence of the buyers, which may bring profit in the future development or production of the product (Kall & Sojkin 2008).

2. Data and Methods

The study was conducted in 2015 using PAPI method. The study involved 233 respondents. Women accounted for approximately 63.5% of the examined and men 36.5%. The studied sample was dominated by young people, aged 18-27 years old, with the share of 31.8%. Respondents aged 28-44 years old accounted for 36.0%, those aged 45-64 constituted 21.98%, and over 64 years - 7.3% of the sample. Three groups of subjects were identified by education level, among which 9.0% declared primary education, secondary education 32.6.5%, and 58.4% higher. Percentage of the respondents rating 63.9% accounted for urban dwellers, while the remaining 36.1% of the surveyed constituted the residents of village. In the descriptive analysis of the results, the structure indicators were used. In order to analyse the relationship between the characteristics measured on a nominal scale the nonparametric chi-square test of independence (χ^2) was used, while the strength of correlation relationship was examined using Cramer's V coefficient and the Yule's Φ coefficient (for tables 2x2).

The main objective of the study was to identify signs of prosumer attitudes of food products consumers.

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3. Results and Discussion

The prosumptive activity of buyers may manifest itself in different ways. Manufacturers encourage and inspire the consumers to co-participate in the creation process of products, designing the packaging, and indicating the media used by the buyers in the course of gathering information about the product. An example of a proprosumer action in Poland may be, for example the Lays brand potato chips campaign, within which the company Frito Lay encouraged the buyers to design their own original flavours of the product. Subsequently, 4 most interesting proposals were selected and introduced into sale. The tool for motivating the consumers to participate in the action was the guarantee of the payment of 1 percent of the profits from the sale of the new product (Szymańska 2011). In turn, Dr. Oetker led a campaign with the aim to support the launch of two new flavours of Guseppe pizza selected by consumers during another promotional campaign. The activities were carried out on a specially created website www.pojedyneksmakow.com and on the Guseppe pizza profile on Facebook. The action aimed to encourage the consumers to experience new flavours of pizza and then vote for their favourite. The taste which received the largest number of votes from the consumers was to be permanently incorporated into the product range. The participants were provided with prizes (Przegląd handlowy 2015). An unusual promotion mechanism involving the consumers in the development of the product had been proposed by Redd's beer manufacturer. It was a precedence action, in which the manufacturer has enabled the customers to design packaging and then introduced them to the market. Participants were able to use the wizard available on the site www.redds.pl, which helped design the cans. The innovative idea of fun was met with great interest - the competition attracted more than 15.000 entries (Marketing przy kawie 2007).

Research prove that today, despite the changes in consumer behaviour, the average buyer is usually reluctant to take prosumer action. The main obstacle in the manifestation of prosumer attitudes is the mentality of consumers, which is determined by their personality and the environment in which they live (Baruk 2011). In addition, consumers in Poland are not prepared for the role of prosumers (Baruk 2014).

The results of own study show that nearly 74% of the respondents agree with the statement that final purchasers should have an impact on the process of creating a food product. The rest of the surveyed (ca. 26%) have the opposite opinion and believe that there is no need for the consumers to have an influence on what the food producers offer on the market. Verification of the results obtained by means of the χ^2 test, confirmed the existence of a weak dependence between the answers received to this question and the gender, age and place of residence of the respondents (Table 1). Among men, over 83% of the surveyed replied yes, whereas among women the rate was approx. 68%. Age also differentiated the respondents. Most responses confirming that consumers should have an impact on the process of creating a product were obtained among persons aged 18-27 years old (79%) and aged 45-64 (approx. 78%), while the lowest percentage of the responses appeared among people over 64 years old (approx. 35%). A greater proportion of individuals favourable to the influence of the consumers on the process of product creation was among the urban population (78.5%) than in rural areas (65.5%).

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Table 1: The opinion of the respondents regarding the participation of the consumers in the process of co-creation of food products vs. demographic characteristics

Demographic variables	χ^2	df	Cramer's V coefficient	Yule's Φ coefficient	p-value
Gender	6.528	1	-	0.1674	0.0106
Age	14.747	3	0.252	-	0.0021
Place of residence	4.7316	1	-	0.1425	0.0296
Level of education	2.7815	2	0.1092	-	0.2489

Source: author's calculations

Modern prosumers were formed under the influence of the Internet and social media (Bobola 2013), which serve as the main channel of communication for them. This fact is also reflected in the results of the study. From the point of view of the respondents, the main manifestation of market activity of the consumers, which to the greatest extent can influence the market offer of food products, are opinion and information posted by them on discussion forums and social networks. The tendency to post opinions about the brand, company or product is both a cause and symptom of prosumption (Abramek 2014). It is associated with the universal access to the Internet and the rapidity and easiness of obtaining and transmitting information through this medium. This tendency is being exploited by manufacturers who give the internet users the ability to add comments on the products, brands, promotional campaigns, etc. on their websites. It should also be noted that, from the point of view the manufacturers, gathering information through various internet forums constitutes sometimes a much faster and easier way to learn the opinions and preferences of the users of the products, rather than conducting marketing research. In connection with the dominant belief of the respondents, stating that communication via the Internet is the best expression of the market activity of the consumers, the remaining manifestations were identified by the relatively small percentage of respondents (Table 2).

Table 2: Manifestations of market consumer activity in the opinion of respondents

	f	%
Discussion forums	104	44.6
Social forums	74	31.8
Sharing opinions by means of a helpline	20	8.6
Participation in marketing research	16	6.9
Participation in lotteries	8	3.4
Participation in sensory studies	5	2.1
Participation in contests	3	1.3
Talking with a customer service agent	3	1.3

Source: author's calculations

Among the reasons for which the consumers exhibit prosumer attitudes, the majority of the respondents indicated negative reasons determining the activity of the consumers. The primary reason is the manifestation of direct dissatisfaction with the current market offer of the companies. But also such reasons as the desire to enrich the product range and to have an influence on quality improvement can also be included to grounds relating to critical evaluation of the companies. This is not the best aspect of prosumption, since it should rely on willing and partner cooperation and not forced by a product offer that does not meet the expectations of the buyers. The remainder of the surveyed pointed to the stimuli positively motivating the consumers towards prosumptive behaviours. Among these, the contests with the possibility of winning a prize constituted the main argument. The desire to share their ideas and the pleasure of creating a product appeared to a lesser extent (Table 3).

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Table 3: Reasons for prosumer attitudes in the opinion of the respondents

	f	%
Dissatisfaction with the market offer	81	34.8
Contests with prizes	70	30.0
The desire to enrich the product range of the market offer	28	12.0
The desire to improve the quality of the product	24	10.3
The desire to share ideas	18	7.7
The pleasure and fun while creating a product	12	5.2

Source: author's calculations

A competent utilization of the activity, commitment and knowledge of the prosumers by food manufacturers may provide an opportunity to achieve competitive advantage. Properly motivated and encouraged prosumer may be a source of company success, e.g. through his influence on brand promotion. This may enable the product to materialize in the consciousness of other consumers and strengthen its market position. In addition, the acquired prosumer may represent a very valuable asset for the producer. He can be very loyal, and loyalty is a feature that is particularly valuable for manufacturers.

As for the scope of the impact that the consumers might have on the product development process, the opinion of the surveyed is divided (Table 4). The highest percentage of the surveyed indicates the change in the current recipe of the product by changing the taste. Such a high percentage of those indications in regard to other results stems from the fact that taste is a decisive determinant in the consumer process of choice and purchase of food products. Therefore, the respondents notice great opportunities of the modification of market offer, e.g. by introducing new flavours for existing products. A relatively large group of respondents believe that the influence on the creation of a food product may be expressed through participation in the creation process of commercials and designing names. These are typical marketing activities that do not require specialized knowledge from the consumers, but rather their creativity and ingenuity. Given that almost everyone can take part in this type of actions, the manufacturers often encourage end-buyers to the aforementioned activities. Other possibilities of influencing the process of creating the products by the consumers are less interesting from the point of view of the respondents.

Table 4: The range of consumer impact on the process of creation of food products, in the opinion of respondents

	f	%
Participation in the modification of the recipe by changing the taste	64	27.5
Participation in the creation process of commercials, slogans	48	20.6
Participation in the design of the product name	35	15.0
Participation in the design of packaging	13	5.5
Participation in the process of changing production technology	12	5.2
No opinion	61	26.2

Source: author's calculations

4. Conclusion

The prosumers is a group of consumers who are active more than average. Openness to innovations, commitment and willingness to co-create new market solutions in terms of products and their marketing are the main determinants of being a prosumer. They acquire information about products or prosumer actions thanks to modern technology and inform others about their related experiences. For the average consumer they constitute a group of opinion leaders with their knowledge and experience. The prosumers constitute an important

group for both the buyers and the manufacturers for which they are assistance in gaining competitive advantage on the market.

The results of the study show, that the majority of respondents have opinion that consumers should have an impact on the process of food products creating. Respondents think, that the participation of consumers in this process may concern cooperation with the producers in the range of modification of the taste of products, creation process of commercials, slogans and products names. In the opinion of respondents, the main reason of manifestation by consumers the prosumer attitudes is dissatisfaction with the offer of products available on the market, but also the desire of entertainment through participation in contest organized by the producers.

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Current trends in the global wine market

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Abstract
This paper aims to subsidise to the understanding of the current trends in international wine trade focusing on the period 2000–2014. Further this paper presents the position for wine production, trade and consumption of the European traditional producers and the new world wine producing countries. Since 2000 the wine trade has grown-up significantly. Its structure has experienced key changes. Such are determining the current competitive scenario of the wine market and are the base elements for its future development. The paper analyses the growth of world wine imports, considering all wines together and the single categories recognized by global statistics (bottled, bulk and sparkling wine). It also describes the changes in the geography of importers with the development of new markets and the new world wine producing countries and the competitive performance. The bulk wine trade, trade in bottles and the re-export of wine are also analysed. Finally, on the basis of the significant trend in wine consumption and changes in the supply chain, the critical subjects arising from analysis are observed.

Key words: *market, packing, production, trade, trends, wine*

JEL classification: *M31, Q13, Q17, F6*

1. Introduction

Wine growing, wine production, wine trade and wine consumption itself have undergone a long development from the historical point of view. While in the Middle Ages, wine was a privilege of the nobility, over time, it has become affordable for everybody. Currently, wine is an important commodity on the global market.

Production, its trade and consumption are influenced by many a variety determinants. They may result from exogenous and endogen conditions (ranging from natural to legislative) and cause changes on the global market with wine and other conditions.

The growth of the international wine trade is just one of the aspects of the complex evolution of the world wine sector: there have been profound changes in the geography of production and consumption and in the direction of export flows (Anderson & Nelgen, 2011). Indeed, the growth of the wine trade was caused during the 1990s by the wine consumption increase in Northern Europe and North America, compensating for the decrease in consumption in Mediterranean countries, and by the growth of exports from so-called New World wine producers (Banks & Overton, 2010). Recently, the international trade in wine has been boosted by increasing demand mainly in Asian countries which until recently were only marginally involved in wine imports, and production is increasing in some importing countries (China, India, Brazil) and in those with considerable potential (Ukraine). Undoubtedly, the growth of the international wine trade makes the wine industry "an intriguing case of globalization at work" (Anderson, 2004).

A major consequence of the increasing importance of the international wine trade is the strong export orientation of the world's large producing countries and the dependence of the profitability of the wine industry on expansion of international trade. The study of the international wine trade is therefore a very important issue but also not easy to tackle. As

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observed by Hugh Johnson, introducing Pierre Spahni's book on international wine trade: “Can there be a more complex trade than commerce in wine? What other commodity is offered in such infinite variety, at prices from inconsiderable to fabulous. Its markets are as almost various as itself, ranging from regions where it is as everyday as bread to milieus where it is elevated (if that is the word) to a fashion item. Governments vary so widely in their attitude to it that in one country it is covered in health warnings, in others used as a tax cow, while in another the only official injunction is not to throw the empty bottle into the nearest ditch” (Spahni, 1998).

The Growth of the international wine trade was encouraged by the process of liberalization in the 20th century. This process was caused not only by creating economically integrated areas, where tariff and nontariff barriers had been eliminated, but also by progression of the WTO towards general and gradual decreasing of duty tariffs and more efficient regulation of non tariffs barriers (Anderson, 2010).

2. Data and Methods

This article aims to show what key changes structure of wine trade has undergone since 2000 and how these changes have determined current trends on wine markets.

Foreign and Czech literature, governmental relevant materials and information of institutions and organizations, which are relevant, have been used to achieve the given aim. All used sources are listed in references.

Problematic of scientific knowledge and analysis of the data obtained are linked in the methodological approach. Procedures of scientific knowledge are based on knowledge classified according to paradigmatic given criteria systematically communicated predominantly in written form (Hendl, 2012). The analysis of data obtained is based on the knowledge subjectively organized according to its importance to the examined problem. (determinantes of-key-change in current trends). Its basis is analytical analysis of previously obtained data from internal and external research. Furthermore pair category of general methods: analysis-synthesis, induction and deduction-specific comparative method and modeling categories of general method were used. Pair category of induction and deduction were used to find out if it is possible deduce a generally applicable rule with from irregularity and regularity

In the present article uses the following territorial division:
Old World: the winery is called Old World Europe and adjacent parts of Asia and Africa.
The New World: includes wineries in Australia, South Africa, South (Argentina, Chile) and North (USA) America, New Zealand and some other wine-growing young country.
Asian countries: China, Turkey, Iran

3. Results and Discussion

3.1 Characteristics wineries Old and New World

Old world wine production began thousands of years ago and wineries became part of the culture of European countries. Centuries of experience has allowed to choose the most suitable wine-growing region, varieties and technologies (on the labels is given the variety and the region where the wine comes from). The region is considered unique and decisive for the quality of wine. Quite often they are Cuvee different varieties. The wines of the Old World countries do not have excessively high alcohol content, they have a delicate aroma and flavor. A high proportion of manual work, the existence of trade unions and the relatively short time working day represent the price / quality ratio comes here sometimes worse than the wines from the New

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World. Precise definition for some wine regions, such as France does not allow fast response to changing fashions and tastes of customers. This in turn also reduces the competitiveness on the world market.

Old world wine production began thousands of years ago and wineries became part of the culture of European countries (Cesaretti et al., 2006). Centuries of experience has allowed to choose the most suitable wine-growing region, varieties and technologies (on the labels is given the variety and the region where the wine comes from). The region is considered unique and decisive for the quality of wine. Quite often they are Cuvee different varieties. The wines of the Old World countries do not have excessively high alcohol content, they have a delicate aroma and flavor. A high proportion of manual work, the existence of trade unions and the relatively short time working day represent the price / quality ratio comes here sometimes worse than the wines from the New World. Precise definition for some wine regions, such as France does not allow fast response to changing fashions and tastes of customers. This in turn also reduces the competitiveness on the world market.

The new world has not so old tradition of winemaking, wine is not some cultural symbol, it is mainly goods. Terroir (Area) plays a minor role, more important is considered the technology. Various experiments are typical, the search for new opportunities, which is facilitated by smaller amounts restrictive rules. Supplying sugar (cooing) are not a problem, on the other hand, the grapes tend to have normally enough sugar because of the warm climate. The wines are usually made from a single grape variety, is an effort to make the wine was really varietal, customers easily recognizable. The wines tend to have a fruity character, are simple, clear, with a higher alcohol content. Usually they are designed for quick consumption, not for archiving. Etiquette stresses especially the variety and the name of the winery. The labels have huge role marketing, for easy readability brands and they are often used motifs of various animals. Wine company owns extensive vineyards produce great amounts of relatively inexpensive wine and have an agreement with the supermarket chain. Winery react quickly to market demands.

3.2 Current trends and issues

Since 2000, the wine trade has significantly increased and its structure has seen big changes. These changes formed the current competitive scenario in the wine market and are essential elements for its future development.

The article analyzed the growth of imports of wines in the world, with regard to all the wines in total and each category recognized global statistics: bottled, tank and sparkling wine. The following describes the changes in the geography of importers due to the emergence of new markets and the competitive performance of major suppliers.

Chain are examined on the basis of the dominant trend in wine consumption and changes in the supply, critical issues arising from the analysis, highlighting the need for further research.

3.3 International wine trade from 2000

In the period 2000–2011, world wine imports grew significantly from 2004 to 2007, and recovered in 2010 after a decline in 2008–2009 due to the international economic crisis. In 2011 world imports reached a new high: EUR 22.6 billion for 3.4 million hectolitres. While world production decreased, world consumption showed a moderate increase because the rise of international trade is the consequence of a considerable increase in consumption in non-producing countries.

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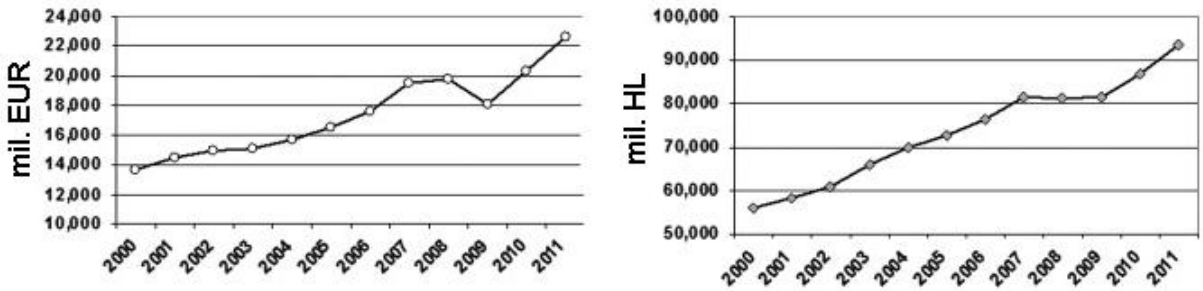
Chart 1: Total world imports of wine, prices



Source: GTI - Global Trade Information Services

Imports in volume increased by 53% and prices by 58% comparing the average for the period 2000-2001 with the years 2010-2011, world (Table 1). All three judging categories grew, albeit at different rates. Tanker wine has the highest growth, followed by sparkling wine and then bottled wine. Given this trend, the share of tanker wines in world trade increased, reaching almost 11% in price expression and almost 40% in terms of volume. The share of bottled wine recorded a significant decrease. As regards growth over the years, imports of bottled wine and sparkling wine have risen steadily (with the exception of a decline in 2007-2009) can be recorded since 2005, the rapid increase in tanker wines.

Table 1: Imports of wines by category

Wine category	2000–01		2010–11		2010–11 vs. 2000–01		
	Imports	Share	Imports	Share	Share	Growth	
					Δ	abs	%
Value							
Bottled	10,7	76	15,741	73	−2.7	5,041	47.1
Bulk	1,262	9	2,238	11	1.5	976	77.3
Sparkling	2,124	15	3,503	16	1.2	1,379	64.9
All wines	14,086	100	21,481	100		7,395	52.5
Volume							
Bottled	34,705	61	49,481	55	−5.8	14,776	42.6
Bulk	19,483	34	35,378	39	5.2	15,895	81.6
Sparkling	2,971	5	5,267	6	0.6	2,296	77.3
All wines	57,159	100	90,127	100		32,968	57.7

Value = millions EUR
Volume = thousand hectolitres
Source: Global Trade Information Services .

As a result of the dynamics of values and volumes, the average unit value (a proxy for price) of total wine imports recorded a reduction (−3.3% to € 2.38), with greater differences by category: a slight increase in the unit value of bottled wine (+3%, to € 3.18), a drop for bulk wine (−2.5%, to € 0.63) and a sharp decrease for sparkling (−7.0%, to € 6.65).

During the period considered, the composition of flows changed considerably, revealing a shift in demand which merits attention. The increase in the importance of sparkling wine stems from increases in consumption occasions and the success of some affordable products (Prosecco in Italy; Cava in Spain) which are presented with a “cool” image and not as cheap substitutes for Champagne.

Instead, the increasing importance of bulk wine is a more complex phenomenon driven partly by changes in consumer demand and partly by the establishing of new organisation schemes in the wine supply chain, seeking cost reductions and a higher level of environmental sustainability.

3.4 Geography of import markets

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The total import flows wines were divided into five groups of countries according to their role on the international market: to explore the changes that have occurred in the geography of international trade (Giuliani & Morrison & Rabellotti, 2011).

- Large importers: three countries which have long been major destinations for wine exports (Germany, UK and United States of America)
- Small traditional importers: 12 countries representing the other consolidated destinations for wine exports;
- Small non-traditional importing countries: 59 countries which have recently expanded their wine imports.
- Mediterranean exporting countries: five wine-producing and exporting countries (France, Greece, Italy, Portugal and Spain)
- Other exporters: five countries with a strong export orientation (Australia, New Zealand, Argentina, Chile and South Africa).

Table 2: Summary of traditional and non-traditional importers of wine

Traditional
Austria, Belgium and Luxembourg, Canada, Denmark, Finland, Japan, Ireland, Norway, Netherlands, Sweden, Switzerland
Non-traditional
Algeria, Azerbaijan, Bolivia, Brazil, Bulgaria, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Ecuador, Egypt, El Salvador, Estonia, Georgia, Ghana, Guatemala, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Jordan, Kazakhstan, Kenya, Latvia, Lithuania, Malaysia, Malta, Mauritius, Mexico, Morocco, Nicaragua, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Korea, Sri Lanka, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, Uruguay, Venezuela, Yemen.

Source: Global Trade Information Services

The following table compares the changes in import flows in the two-year averages in 2000-01 and 2010-11 for all wine categories. Analysis of the data shows an increase in the share of small innovative countries in the world imports, which accounted for approximately 20% of the value, especially at the expense of large importers, who lost about 11 percentage points. In volume terms, the small traditional importers represent almost 22% of the market and a sharp rise in their share (more than 13 percentage points), contrasts with the fall of the proportion of large and small producers. Wine imports by groups of countries and categories of wine, average 2010-11 compared to the 2000-01 average: absolute (ABS) and relative (%) growth; Import shares in 2010-11 (%) and change (Δ) in the period.

Table 3: Wine import according to countries groups and category

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Groups of importers	All wines				Bottled wine				Bulk wine				Sparkling wine			
	Growth		Import share		Growth		Import share		Growth		Import share		Growth		Import share	
	abs	%	%	Δ	abs	%	%	Δ	abs	%	%	Δ	abs	%	%	Δ
Value																
Large importers	1,549.1	21.1	41.4	−10.7	784.3	13.6	41.6	−12.2	467.3	112.4	39.3	6.3	297.5	25.4	42.0	−13.2
Small traditional	1,907.0	39.5	31.4	−3.6	1,241.2	32.6	32.1	−4.4	180.3	38.7	29.0	−9.2	485.5	87.8	29.7	4.0
Small non-traditional	3,393.2	368.9	20.0	15.2	2,688.3	396.4	21.3	17.2	272.8	272.3	16.7	8.6	431.3	303.4	16.3	10.8
Mediterranean exporters	227.2	26.8	5.0	−1.4	132.4	35.7	3.2	−0.3	29.8	11.2	13.1	−9.4	65.1	30.8	7.9	−2.4
Other exporters	319.6	216.8	2.2	1.0	194.8	222.8	1.8	0.9	25.6	167.0	1.9	0.2	99.3	222.2	4.1	1.8
Total	**7,396.1**	**52.5**	**100.0**	**0.0**	**5,041.0**	**47.1**	**100.0**	**0.0**	**975.7**	**77.3**	**100.0**	**0.0**	**1,378.7**	**64.9**	**100.0**	**0.0**
Volume																
Large importers	12,286.8	47.4	42.4	−2.9	3,237.3	17.8	43.3	−9.1	8,499.8	140.6	41.1	10.1	549.7	32.4	42.6	−14.6
Small traditional	4,388.1	26.5	23.3	−6.2	2,228.5	19.4	27.7	−6.2	1,381.5	31.4	16.4	−6.3	778.2	112.8	27.9	4.3
Small non-traditional	13,979.9	250.8	21.7	13.5	8,321.2	255.8	23.4	16.5	4,864.1	235.9	19.6	9.6	794.6	307.5	20.0	12.2
Mediterranean exporters	1,710.4	20.3	11.2	−4.1	643.2	42.8	4.3	−0.2	963.9	14.4	21.5	−13.0	103.4	41.1	6.7	−2.2
Other exporters	602.6	92.1	1.4	0.1	345.7	120.3	1.3	0.4	186.2	63.0	1.4	−0.4	70.7	98.9	2.7	0.3
Total	**32,967.8**	**57.7**	**100.0**	**0.0**	**14,775.9**	**42.6**	**100.0**	**0.0**	**15,895.5**	**81.6**	**100.0**	**0.0**	**2,296.5**	**77.3**	**100.0**	**0.0**

Value = millions EUR
Volume = thousand hectolitres
Source: Global Trade Information Services

Overall, during the years 2000-2011 occurred in international trade in wine, as regards the price to 46% increase and a 42% increase in volume. This increase was generated by small non-traditional importers. The three largest importers contributed 21% to the price increase and 37% in volume and small traditional importers 26% of the price, but only 13% of the volume.

3.5 The main changes in the period 2001-2012

The large importers who in 2011 represented more than 40% of the world market in each category, increased their share in terms of price only in global imports of wine tanker and about 10% in volume.

For all categories, however, the increase of imports in terms of price is always lower than the volume, and therefore, the unit price of imported goods declined. Tanker wine could be replaced by bottled wine at a lower price.

Small traditional importing countries have increased their importance in global imports of sparkling wines, although the average unit price fell. Unlike large importers, imports of bottled wines and tank achieved better results in terms of price. So, the average unit price for both categories have increased, in particular as regards tank wines whose price is the highest international level (EUR 1.12). In these countries, the share of imports in the total bottled wine exports dropped in favor of sparkling wines. Small non-traditional importers are the only group that increased its share in all categories, both in price and volume. The increase flows in prices is greater than the volume so that the average unit price for all categories of products rose (EUR 2.9 bottles, EUR 0.54 tankers, and EUR 5.44 for sparkling wine). Imports of bottled wine showed the highest growth now stands at about 78% of total imports in the prices of this group (increase of more than 4%).

Mediterranean exporting countries lost shares in all categories, while other exporters increased their holdings slightly. This increase is likely due to increased consumer preference imported wines and the growth of transfers between production units of multinational groups.

The flow of imports largely towards new destinations has two major consequences:
• International distribution network for wine changes to accommodate the new structure of international demand. Mediatory activity is developing in countries other than the countries producers and consumers. Changing the traditional competitive relationships between intermediaries and vertical relationships throughout the supply chain;
• The second important consequence of changes in the geography of importers is that trade barriers are becoming more and more important;
• Trends competitive behavior by large exporters in the 21st century is changing. New World in the 90-ies of the last century, recent years have shown the new complex situation. Manifests

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different behavior among exporting countries in respect of: the categories of wine (bottled and tank) and the dynamics of prices, volume and market share of different groups of markets. All reported changes determine (directed) to define the current situation and trends in the global wine market.

3.6 The current state of the global wine market

The International Organization of Wine (OIV) states that the biggest drop in wine production in 2014 hit key European producers, where drought against 2013 decreased production by about one sixth. It falls, as shown in the table below corresponds to a decrease of world wine production.

Table 4: World wine production and consumption 2000- 2014 (mil.hl)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Production	280	266	257	264	296	278	283	268	269	273	265	268	258	291	270
Consumption	226	228	230	237	237	237	245	250	250	242	240	243	243	243	240
Variance	54	38	27	27	59	41	38	18	19	31	25	25	15	48	30
%	81	86	89	90	80	85	87	93	93	87	91	91	94	83	88

Source: The world market for wine-Retail News, OIV Statistical Report on World Vitiviniculture

World wine consumption in relation to production in the period 2000-2014 increased from 80% in 2004 to 94% in 2012. Absolutely lowest world production in the period was in 2002 (257 million hectoliters) and the highest in 2004 (296 million hectoliters). Absolutely lowest world consumption of wine was in 2000 (226 million hectoliters) and the highest in 2007 and 2008 (250 million hectoliters). In the reporting period 200-2014 World wine production oscillates up to 300 million hectoliters and consumption up to 250 million hectoliters. The world's biggest wine producer France remains (in 2014 produced 46.7 million hectoliters). Most wine imports in Germany and Great Britain. The biggest consumer by 2013 the US: in 2014, consumption was almost 31 million hectoliters, followed by France 28 hectoliters Italy 20 hectoliters and the same amount consumed in Germany. (The world market for wine, 2015). Over the period 2010-2014 there has been a marked shift in the structure of consumption by continent, as shown in Table 5:

Table 5: The shift in consumption patterns (in%)

Y/Continent	Europe	America	Asia	Africa	Pacific
2010	69	20	6	3	2
2014	60	24	10	3	3
Variance	**-9**	**4**	**4**	**0**	**1**

Source: The world market for wine-Retail News, OIV Statistical Report on World Vitiviniculture

The value of international trade in wine in the period 2000-2014 almost doubled from 13.7 billion. 25.6 bn. EUR. In 2014, the volume against 2013 increased by 2.5%, but the value remained approximately the same. But changed the type of products (category) in 2014 exports of bottled wine decreased at 54% of trading volume, compared with 65% in 2000. Sparkling wines make up 8% of the volume, the total value of exports accounting for 18%. The most obvious difference between the value and the volume indicator for wine tanker (transported in large containers). In 2014, 38% of the volume (in 2000 it was 30%), but only 11% of global wine exports (World wine market, 2015).

4. Conclusion

According to Agri France, a specialized division of French bank BNP Paris Wealth Management states in the global wine market as a key current trend:

1. Exports for the past 20 years has doubled. Europe retained the leading position in exports of 58% of its production (for first 3 places as Spain, Italy and France).
2. New producers - New Zealand, Chile, Australia, South Africa increased its share of world production of wine.
3. The biggest consumers have become US (nearly 11 liters / person / year), leaving behind France.
4. 84 most famous brands of wine from the hundreds of French.
5. Europe still accounts for about half of global consumption.

One key question is the role of the characteristics of Old World wines and, in particular, whether the heterogeneity of the European wine supply may be considered a source of value for consumers. A second critical issue is the value (or disvalue) of the industry structure in the larger Old World producing countries. Although the wine industry shows a low degree of concentration worldwide, its concentration is even lower among Old World producers. That said, large companies are emerging also in such countries, often through the merging of cooperatives. The difference in the industry structure between Old World and New World is not only in terms of concentration, but also due to the different organisational model of the firms.

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Producer's organization and digital technologies for farms' competitiveness

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Abstract
The agricultural sector is characterized by increasing complexity and several factors could have a negative impact on agricultural small and medium-sized enterprises' (SMESs) competitiveness. There are two way to improve farms competitiveness: dimensional growth, achievable through the horizontal aggregation of producers (POs), and innovation, achievable through Information and Communication Technologies (ICTs). Although several studies have pointed out the positive influence of ICT tools on SMEs performances growth, there is a lack of works concerning the way POs use ICTs web based in order to improve innovativeness and competitiveness of their small farmers. After a preliminary literature review regarding the main drivers for the adoption of ICT and technological innovations in agriculture, an exploratory analysis was performed through a set of in depth interviews to opinion leaders in associated farms of a PO. This qualitative methodological approach aims to investigate the POs contribution in enhancing process or product innovation, improving competitiveness and transferring knowledge, among the associated farms through the use of ICT tools. Findings confirm the main hypothesis on which this study is based upon and are supported by theoretical implications shown in the literature review.

Keywords: *Competitiveness, Digital web based technologies, Innovation, Knowledge transfer, Producers Organizations (POs)*

JEL Classification: *O13, O32, O47*

1. Introduction

Over the last years the agriculture sector is achieving higher importance for people health and for countries' economies. The low productivity represents one of the hardest problem of the agricultural sector which is facing huge challenges and increasing pressures from a plethora of stakeholders (governments, consumers, distribution system, etc.) in order to assure some of the current issues, such as to feed a growing population and guarantee food security, to improve high standards of food quality and healthiness, but also to increase farms competitiveness and to improve farmers' working conditions (Kale, Rohilla, Meena & Wadkar, 2015; Pignatti, Carli & Canavari, 2015; Bunte, Dijkxhoorn, Groeneveld, Hofstede, Top, van der Vorst & Wolfert, 2009). Therefore, small and medium-sized enterprises (SMEs) compete into this dynamic context in rapid evolution. Agricultural SMEs, which hold the major part of the agricultural production, play a significant role for the domestic economic development and they contribute to local income, employment, exports, and entrepreneurship development (Boohene, Sheridan & Kotey, 2015; Wolfert, Verdouw, Verloop & Beulens, 2010). In such varied and complex sector, the horizontal aggregation of several small players is a strategy to increase farmers' bargaining power toward large retailers networks, to improve their innovativeness and to enhance their products' brand awareness among a larger number of potential consumers: that's the key mission of Producer Organizations (POs). As also defined by the European Commission in 2009, PO aims at providing better market opportunities to its members and at increasing their competitiveness (Petriccione & Sollazzo, 2012). In order to cope with the agri-food sector challenges, another strategic choice and a mandatory step for agricultural development is the

adoption of technological innovations, which present several potentialities in order to improve competitiveness at different phases of the agricultural value chain and to buffer some of the limits to agricultural development. Actually, the implementation of technological innovation could generate income, share tasks and skills, increase productivity, accelerate communication and much more (Pignatti et al., 2015; Zaremohzzabieh, abu Samah, Muhammad, Omar, Bolong, Hassan & Shaffril, 2015). In the light of this, development of influence of Information and Communication Technology (ICT) on agricultural activities cannot be underestimated and SMEs should consider the use of ICT tools as a significant strategy to improve their competitiveness (Boohene et al., 2015). According to this strategic perspectives, through the use of digital web based technologies, POs should also invest in knowledge dissemination in order to systemically increase the quality of their networks (European Commission [EU], 2009) and to support farmers in sharing skills and experiences. Indeed, ICTs based tools allow to create, store and disseminate this knowledge among the associated farms in a rapid way (Kale et al., 2015).

The aim of the paper is to analyse if and how the POs, by using the digital web based technologies, affect their associated farms' performances in terms of:

- product/process innovation enhancing,
- competitiveness improvement,
- knowledge transferring and sharing.

1.1 The role of ICT tools in agricultural sector: a review

The adoption of ICT tools by SMEs and its determinants have been deeply investigated in literature (Spinelli, 2016; Pignatti et al., 2015). Several studies have pointed out the positive influence of ICT tools on SMEs performances growth in terms of productivity, profitability, market share and global market accessibility (Boohene et al., 2015).

By definition, ICT is a technology that allows communication and transmission of information, electronic capture and processing (Parliamentary Office of Science & Technology, 2006). It is more than physical software and hardware because it includes electronic technologies, resources and techniques used to acquire, manage and share information and knowledge, and it is useful to develop online resources for effective tasks performance and to simplify sharing of electronic data (Boohene et al., 2015; Zaremohzzabieh et al., 2015). ICT tools are wildly spread into almost every socio-economic activities and they are also employed for rural economic development. Actually, numerous studies reveal that ICT adoption improve productivity and socio-economic development (Boohene et al., 2015; Zaremohzzabieh et al., 2015).

The large set of technological innovations introduced in agricultural sector can be divided in tools and equipment for in-field activities and in information management systems (Pignatti et al., 2015). The use of digital web based technologies could affect agricultural SMEs' performances in terms of product or process innovation enhancing, competitiveness improvement and knowledge transferring and sharing.

Regarding the enhance in process and/or product innovation, researches on the use of ICTs in the agri-food sector are developed on experiences from agriculture, industry or retail, experiments in living lab or field trial environments, and moved from scientific contributions related to the food sector. Several scholars focus on the different ways of utilizing ICT for the agro-food sector's needs: precision agriculture in primary production (Pignatti et al., 2015; Stafford, 2007; Zhang, Wang & Wang, 2002) as well as tracking and tracing of food products along the food value chain (Trienekens & van der Vorst, 2006) and the identification of product characteristics through labels and logos for consumer support (Sahota, Haumann, Givens &

Baldwin, 2009) represent the most important research topics in serving the sector's and consumers' needs, emerging by the literature review. A discussed topic in the literature regards the constraints that agricultural SMEs find in adopting innovative ICT tools in their processes, due to several reasons, such as age, level of education, farm size, type of production, income, ease of use, perceived benefits and training (Pignatti et al., 2015; Bewley & Russell, 2010). Nevertheless, technological innovations could provide many benefits and opportunities for improvement in the agricultural sector characterized by some organizational and managerial lacks. Actually at farm level, ICTs can intensify efficiency and productivity, both in terms of performance (e.g. production's optimization, reduction of costs, etc.) and of working conditions (e.g. automation, digitalization, etc.), they can improve the access into new market segments and production areas and they can also enhance yields and products' quality and farmers' revenues, especially in geographical areas where high quality agricultural products are produced (Pignatti et al., 2015). Through the aggregation of farms belonging to the same regional area, POs can create niche networks and communities of practices that could contribute to the economic growth and, more extensively, to the social wellbeing of a region (Wolfert et al., 2010; Wilson, 1996; Jonassen, 1994). Studies on the relationship between ICT and farms' performances highlight a positive correlation between the use of digital web based technologies and productivity (Bughin, Chui & Manyika, 2012; Bunte et al., 2009; OECD, 2003).

From the perspective of competitiveness improvement, a host of authors highlight how SMEs growth and performance depend on the influence of a range of forces, such as the quality of their management, the tastes of their customers, the government policy, etc. Among these variables, ICT is an highly noted contributor to the farms growth and it has a positive impact on farms profitability. ICT offers huge opportunities to agricultural SMEs and a wide range of possibilities for improving their competitiveness (e.g. access to new market opportunities, direct contacts with suppliers, immediate feedback from consumers, useful information services to general public, etc.); moreover, the ICT adoption boosts farms performance through cost savings (Boohene et al., 2015).

According to the European strategies 2020 and to the rural development policies, SMEs' smart and sustainable growth is also supported by the knowledge transfer (Reg. (EU) n. 1305/2013, CAP 2014-2020). Knowledge is often considered as a key resource for the farms competitive advantage (Rullani, 2004; Davenport & Prusak, 1998) and its management involves strategies and processes designed to support value creation, to sustain and enhance the capturing, assessment, sharing and creation of organization's intellectual assets, in order to improve SMEs performance and competitiveness (Boohene et al., 2015). Knowledge management justifies the ICTs adoption for SMEs managing, due to the significant shift from businesses oriented toward the production of goods to businesses oriented toward the production of knowledge. Actually, the ability to create, utilize and develop knowledge based assets influence SMEs success, (Boohene et al., 2015; Bunte et al., 2009). This evolution has a disruptive impact on practices, structures and organizational skills also in the traditional economic sectors. The technology business ecosystem gives a strong impetus to the process of codifying and redefining educational needs (OECD, 1996). Indeed, ICT tools help to transfer knowledge among SMEs members, to support the creation of new knowledge and to enhance internal relationships, communication and collaboration processes (Boohene et al., 2015). The use of ICT tools enhance practices, retain and reuse knowledge and experience in new activities, and share informal knowledge and experience (Toikka, 2007). Then the social technologies increase the possibilities of horizontal growth through a workers organization know how exchange because break down the space-time barrier (Davidson & Goldberg, 2010; Hendriks, 1999). Greater availability and easiness access to knowledge united to possibilities to share and distribute information are today an important factor for SMEs growth and development (Davidson &

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Goldberg, 2010; OECD, 1996). The new technologies support collaboration in the organization and between organizations (Bunte et al., 2009). This social aspect (sharing, collaborating, communicating, etc.) of technologies in the companies could rise the interaction among workers and the efficiency of work in term of productivity (Bughin et al, 2012).

While several studies focus on the diverse benefits deriving from the use of ICTs in agricultural sector, there is a lack of works concerning the way POs, in particular, use ICTs web based to transfer and share knowledge to their small farmers in order to improve their innovativeness and competitiveness.

Our research interest is then focused on how the POs use the digital web based technologies to transfer knowledge to farmers and to promote innovation in the agri-food sector. The study discusses how the POs define their contribution in the innovation of processes and products, how do they help the dissemination and the sharing of best practices, how do they improve farms competitiveness.

2. Data and Methods

Since the aim of this study is to investigate the POs contribution in enhancing process or product innovation, improving competitiveness and transferring knowledge, among the associated farms through the use of ICT tools, a preliminary literature review was conducted in order to identifying the main drivers for the adoption of ICT and technological innovations in agriculture. Then, an exploratory analysis was performed through a set of in depth interviews to opinion leaders in associated farms of a PO: this qualitative methodological approach aims to explore associated experiences and opinions in order to shed light on basic or latent mechanisms and interactions related to the use of ICTs in agricultural sector.

The exploratory nature of this study requires a hybrid research designs. Firstly, evidences were provided for defining variables to investigate. Within this research framework, it is hypothesized that PO, by using ICT tools, can help the associated farms in improving their innovation, competitiveness and knowledge levels. In order to investigate the research questions, the questionnaire was structured with 19 questions, some of these were built with binary options, some others were developed to scaling responses; for these latter questions five Likert Scales items have been adopted, using the following Likert rating scales (Allen & Seaman, 2007): Not important at all; Unimportant; Neutral; Important; Most important. The survey was structured in three sections: the first one aims at highlighting the general characteristics of the farms and the role PO plays; the second one seeks to describe the ICT tools used by the farms; the last section aims at investigating the way PO use digital web based technologies in order to enhance product/process innovation, to improve farms competitiveness and to transfer and share knowledge among associated farms.

Data collection was performed throughout online interviews to the associated farms of a PO in Apulia Region (Italy), during the period July - October 2015. Data were ascribed in a Microsoft Excel spreadsheet. Whereupon, using the functional language R (also called GNU S), descriptive statistics analysis were performed.

3. Results and Discussion

Since a preliminary analysis of the agriculture framework, it emerges that Italian agricultural sector is rather well-structured. Following Romania, Italy is the country with the largest number of farms in the European Union. In 2010 (date of the last survey), 1.630.420 farms operate in Italy. In the last decade the number of farms decreased by 32.2%, while the average farm size

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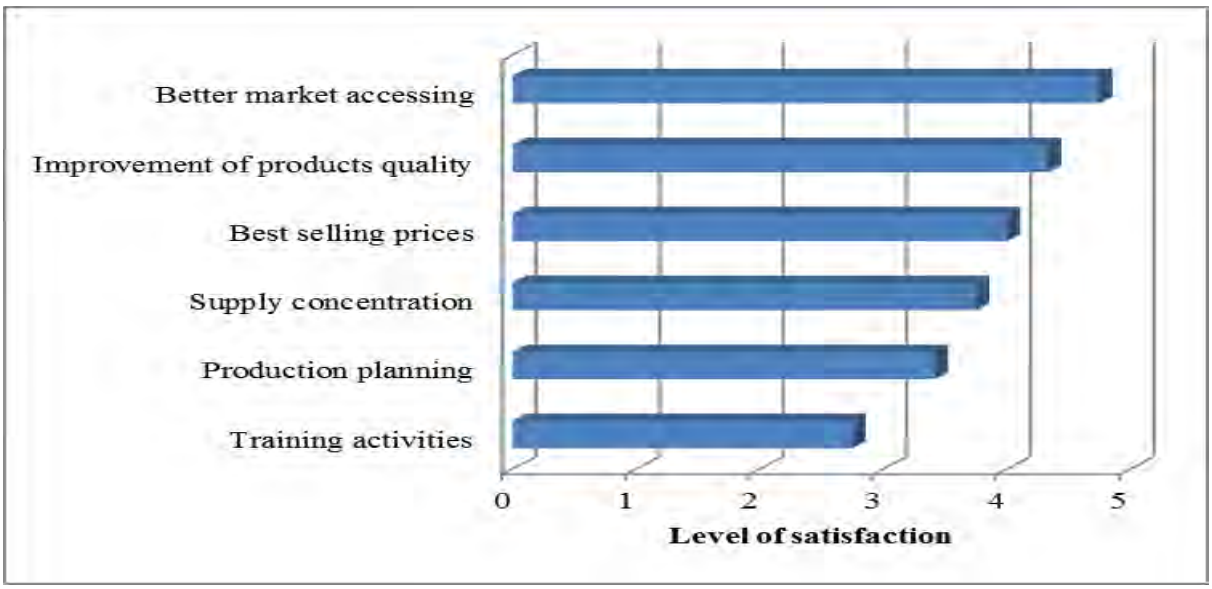
increased by 44.4%. This is due to a multi-year concentration process of agricultural land in a significantly reduced number of farms. Actually, approximately the 50% of Italian farms operates in four regions of Southern Italy: Apulia is the region with the highest number of farms (17%), followed by Sicily (13%), Calabria (8%) and Campania (8%). In 2011, the farms' competitiveness level (added value per employee for every 100 Euro of unit labour costs) is about 130 Euro, recovering over 2010 (Istat, 2011). Despite the great concentration of farms, the agricultural sector of the South of Italy is highly fragmented and it essentially consists of SMEs. Nevertheless forms of associations are widely spreading: Apulia counts 34 cases of Producer Organisations (Istat, 2011).

The case study of this work is a PO in Apulia region in the South of Italy that is one of the first regions nationwide in producing fruit and vegetable, thanks to favourable climatic conditions. The PO, acknowledged in 2012, is one of the largest producers organization in the Apulia region, composed by 40 producers, and it operates in the production area between the north and the south of Bari. More than half of the analyzed companies are cooperatives, which include within them many farms: this makes the subsequent data analyzed even more representative of the situation of the examined territory.

From the survey it emerges that PO is determinant for the associated farms, due to its dedication in allowing the achievement of significant aims, such as the innovation enhancement, the competitiveness improvement and the knowledge sharing. Actually, the associated farms evaluate positively the PO ability to ensure a better access to markets and its support in stabilizing producer price: they consider it a right way to guarantee a greater competitiveness whit respect to their competitors. Associated farms are also quite satisfied of the PO actions related to enhancement in innovation, such as the improvement of products quality. It seems that the training activities are not a strength of the PO supply (Figure 1).

Figure 1: Farms satisfaction level with respect to PO activities



Source: Authors' elaboration

Nevertheless, all respondents participate in periodic training, because they believe that attending training courses can help to improve the company's competitiveness. Farms attend courses on several theme, such as promotion of product, process and organizational innovation, update of professional profiles, etc. In general these training courses are held in the form of classroom seminars, while companies consider e-learning courses not very effective.

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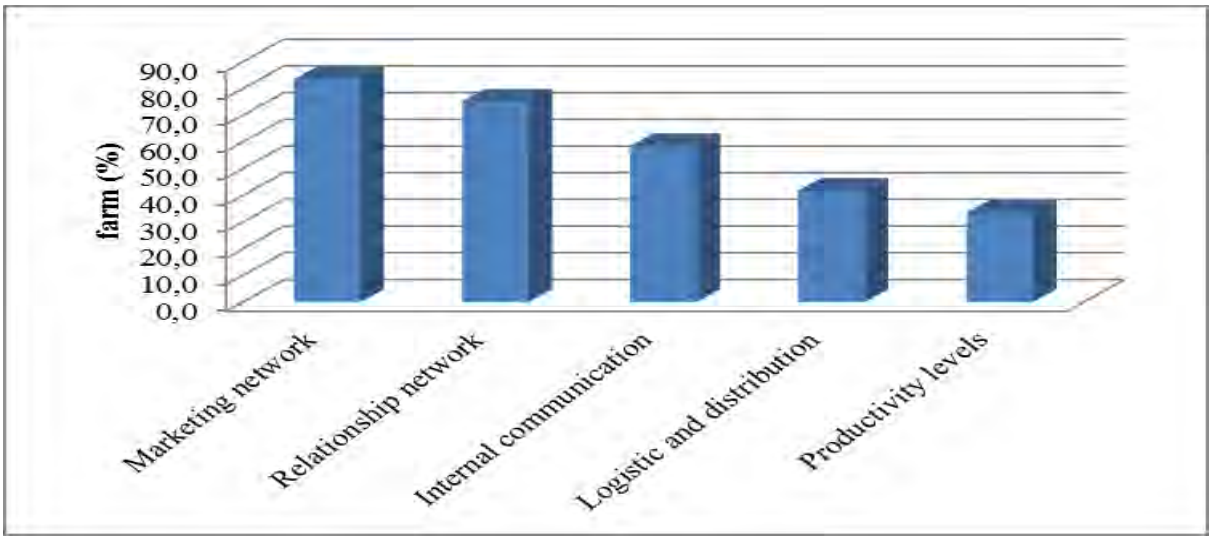
Regarding the ICT tools used by the farms, in general the respondents essentially use the web based technologies to improve their marketing network and to enhance their relationship with customers and suppliers. Sometimes farms also use applications on Smartphone for the best management of company's activities, like the logistical and the distribution aspects (Figure 2).

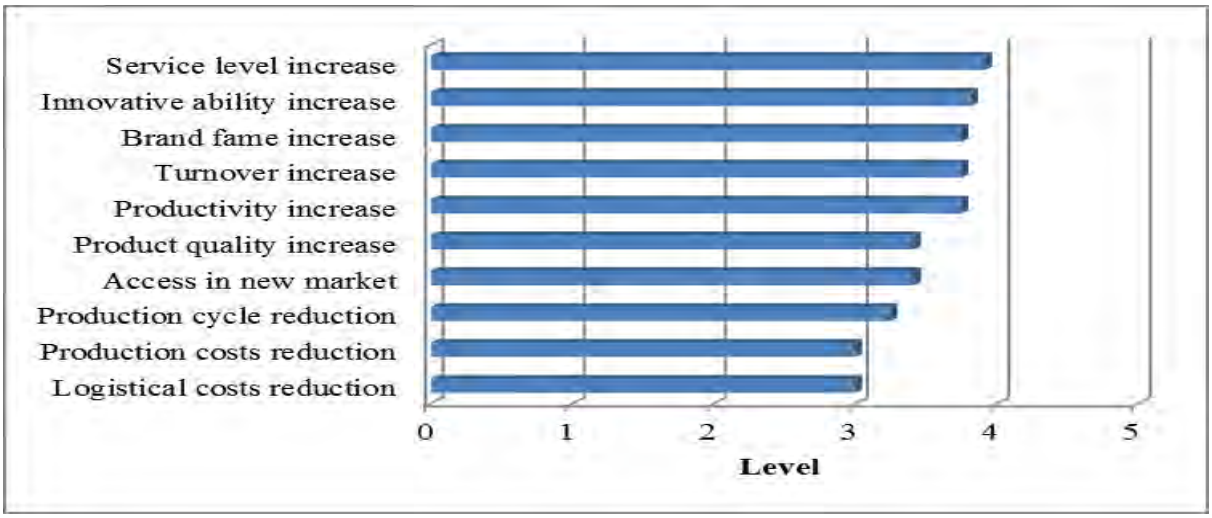
Figure 2: Using purposes of ICT tools



Source: Authors' elaboration

Lastly the survey investigate how PO, through the use of digital web based tools, help the associated farms in obtaining better business results (Figure 3).

Figure 3: Business results obtained by the use of ICT tools



Source: Authors' elaboration

The collected answers highlight that PO intervention help to increase the innovative abilities of the associated farms in order to enhance product or process innovation. Moreover, it is important the possibility that the PO offers to have access in new markets: this can help farms to improve their competitiveness.

4. Conclusion

This work provides an exhaustive background regarding the benefits of the adoption of ICTs in agricultural SMEs, associated in a PO.

The agricultural sector is characterized by increasing complexity. Several factors (e.g. quickly change in consumption needs; greater attention to food safety, healthiness and sustainability; growing market power of large retailers networks; etc.) could have a negative impact on agricultural SMESs competitiveness. There are two way to improve farms competitiveness: dimensional growth and innovation. The former is achievable, in the medium term, through the horizontal aggregation of producers (POs); the latter is achievable through the knowledge transfer process, whose greatest potential derives from ICTs web based, which help to share skills and experiences among the producers.

This work outlines the relationships between the PO's use of ICTs and its associated farms' performances, in terms of competitiveness, innovativeness and knowledge transferring capacity. Findings confirm the main hypothesis on which this study is based upon and are supported by theoretical implications shown in the literature review.

This exploratory research is ongoing and its findings are far from being final. Further research and analysis in order to corroborate our hypothesis is necessary. The sample of companies could be expanded numerically, but also geographically.

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Consumers shopping behaviour in the Nitra city

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Abstract
Consumers shopping behaviour is an important sociological phenomenon seen as a manifestation of consuming way of live. Its character is largely influenced by the society in which the consumer uses goods and services. The rate of consumer behaviour is influenced by the availability of goods, sales culture, offer of sales concepts, real household income, lifestyle, and marketing activities of sellers. It affects not only the economy, but also it has significant social and cultural impacts. In specific cases, it also has an important spatial function in terms of catchment areas to the selected shopping centre. At present, shopping behaviour of the population directs towards a modern type. It is characterized by emotive purchases and a consumer is influenced e.g. by advertising, purchases discounted product, numerous purchases in a single day, has high demands on quality of goods and shopping comfort, optimizes the ratio between price and value of goods, prefers large-scale retail shops and regularly uses car for shopping. The paper presents the results of the behavioural survey in the city of Nitra in the category of personal consumer in 2014 with the aim to confirm the presupposition of the modern type of behaviour of the Nitra consumers.

Keyword: *stages of development of retail network, consumers shopping behaviour, catchment area of shopping centre*

JEL klasifikácia: *D1, D3, R2, R3*

1. Introduction

Shopping behaviour is a sociological phenomenon defined as behaviour through which consumers express themselves in searching, purchasing, utilization, evaluation and application of goods and services, which are expected to meet their needs. In general, changes in shopping behaviour are caused by 3 attributes: need, offer and resources that are strongly influenced by socio-economic conditions in households. Within the decision-making process in shopping, consumer undergoes a shopping process, during which consumer assesses and compares offered available alternatives and thus decides for one or more of them. A consumer faces various effects in the decision-making process and those effects can influence this process by various intensity and significance resulting in the different result.

1.1 Literature review

Shopping is a complex and interdisciplinary phenomenon in the interest of many scientific disciplines. Sociological aspects and expressions of consumer way of life are explored within the studies by Keller (1993), Knox and Pinch (2000), Lux (2002), Wilk (2003b, 2005a), etc. The analysis of consumers shopping behaviour in relation to the age was the matter of study by Jasiulewicz (2012). The author pay attention to on-line shops that present a threat for traditional shops, whilst consumers visit traditional stores based on impression, often feeling, which is considered to be more important in comparison with on-line shop. Within geography of retail, changes in shopping behaviour in terms of spatial relationships in the context of demographic processes were evaluated by Spilková (2012), Kunc et al. (2013), Mitríková et al. (2012, 2015), Trembošová (2009b), Križan et al. (2015), Bilková et al. (2015), Civáň, Krogmann (2012) or Civáň, Svorad, Krogmann (2014). The issues in changes of consumer mobility to services in

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catchment areas were explored by Frantál et al. (2012), Maryáš et al. (2014). Spilková (2003) considers shopping centres as a driving force of formation of modern shopping behaviour in the period of transformation and she processed retail behavioural surveys in Prague. Similarly, Mitríková (2008) published the study on shopping behaviour in Prešov and Košice. Shopping behaviour as a sociological expression of transformation of retail network in the city of Nitra was explored by Trembošová (2009c, 2010). The development of retail network in the city of Nitra in new market conditions (during the last two decades) was assessed by Trembošová and Dubcová (2013). Since the 50s of the 20th century, classification of consumers behaviour has become the matter of study of many researches such as Stone (1954), Kotler (1965), Bellenger et al. (1978), Bloch et al. (1994), Guy (1998). There are also many inspiring studies focused on the differences between shopping behaviour of men and women (Firat, 1993), while women are explored more frequently (Otnes, McGrath, 2001, Dennis, Newman, Marsland, 2005).

The aim of our paper is to evaluate the perceptual research focused on shopping behaviour of the Nitra city population in particular city boroughs in 2014.

2. Data and methods

The object of our study is the Nitra city population and its shopping behaviour. Based on the previous researches that were realized in 2004 and 2008, there was confirmed a commencement of modern orientation in shopping behaviour of the Nitra city population. We formed a hypothesis "Shopping behaviour of the Nitra city population tends to modern tendencies", which should prove or disprove whether those tendencies continue or if there are some changes and signs of comeback to traditional shopping behaviour. The main tool for obtaining soft data lied in the questionnaire research, which was divided into two sections. The first was dedicated to the choice of place of shopping in the following arrangement: i) choice of place of shopping food and consumer goods based on the prevailing identical responses, ii) analysis of dominant factor that influences the choice of store by respondent, iii) factor of purchasing power (household income). The second section was devoted to the shopping behaviour based on knowledge that consumer behaviour divides customers into the particular categories according to the different ways of their behaviour. Analysis of sociological and shopping types of questioned respondents determines a group of shopping orientation, its size and spatial distribution at the level of city boroughs as well as the Nitra city population as a whole.

Respondents were questioned outside the shopping centres in order to avoid influences by those centres. There were many places, where this research was realized, such as bus stops, crossroads, pedestrian zone, cultural events and farmers market.

2.1 Respondents

The questionnaire research was realized in October and November 2014 by students of the Department of Geography and Regional Development, FNS, CPU in Nitra as well as by authors' personal way. The research sample consisted of total 796 respondents older than 18 with a permanent residence in the Nitra city. Those questionnaires that were fulfilled incorrectly were not included in further process of evaluation. Even 91 sheets were excluded, mainly because of missing information about the household income. Finally, we got 705 questionnaires, while they came from the following city borough (hereinafter referred to as CB): 37 from Mlynárce, 30 from Čermáň, 32 from Janíkovce, 23 from Dražovce, 6 from Kynek, 4 from Horné Krškany, 8 from Dolné Krškany, 18 from Diely, 5 from Párovské Háje, 78 from Zobor, 109 from Chrenová, 111 from Klokočina and 244 from Staré Mesto.

Within the surveyed sample, women predominated over men (459 women; 65.1%; 246 men; 34.9%). In terms of age, the most of (25.5%) respondents were registered from 40 to 49 yrs and

the age category covering people between 20 and 29 yrs (23%) followed by respondents from 50 to 59 yrs (16%) and the group consisting of people at 60+ age (15%). The most of women was registered in the age category 40 – 49 yrs (127 women), while the majority of men was identified within the age group 20 – 29 yrs (60 men). Contrary to that, the lowest proportion reached the category under 20 yrs (7 men and 7 women). Within the scope of education, the majority of respondents completed secondary education (74.2%), followed by university (19.2%) and elementary (3.6%) level of education. Even 25 of them did not type their level of education.

Taking into consideration an economic status of the sample, employees (47.7%) dominated and they were followed by students (16.6%), pensioners (16%), entrepreneurs (10%) and unemployed (9%). In terms of monthly net income, the most of respondents (33.4%) ticked the category from 801 to 1,200€, followed by people with earnings at the level from 401 to 800€ (21.1%). The income from 1,201 to 1,600€ was chosen by 20.1% respondents, followed by those, who earn less than 401€ (11.6%), participants earning from 1,601 to 2,000€ (8.6%) and 5.1% of respondents ticked income higher than 2,000€.

2.2 Selection of shopping place

Geographical evaluation of location of retail shopping centre in the city respects the fact that each centre of equipment is a centre of catchment area based on the level of influence of predominant trips of residents to the centre (Szczyrba, 2001). We used answers from questionnaires in order to observe as well as delimitate the catchment area of place through shopping equipment. Respondents should type the locality (store), where they shop the most frequently: *i) Type the store in the Nitra city, where you shop food, clothes, shoes, drugstore and consumer goods most often. ii) Which of the shopping centres in the Nitra city do you prefer and what are reasons for your selection? (assortment – stores, accessibility, habit, environment, lower prices, parking, leisure time activities).* Based on the dominant and identical answers to selection of locality, the centres of shopping activities were chosen and we delimitated their catchment areas in accordance with methodology by Trembošová (2009a).

In terms of selection of locality of stores, many authors (e.g. Viturka et al., 1998) pay attention to the parameter of purchasing power (PP) – it is defined as a multiple of expenses per capita (E) and number of inhabitants (I), i.e. PP = E x I. Expenses of households recalculated per capita are recorded at the regional level in Slovakia. Thus, we formed respondents' purchasing power according to their reactions to these questions: *i) How much is your monthly net income of your household? ii) How many members is your household consisting of?* With respect to the personal character of question focused on the income, 6 intervals were arranged: below 401€, 401 – 800€, 801 – 1,200€, 1,201 – 1,600€, 1,601 – 2,000€, above 2,000€. In order to determine the purchasing power in each city borough, we multiplied the number of answers within the each interval by the mean value of interval and then divided it by the number of persons in household. Thus, we found out information about per capita income in household. We counted those data for each interval and calculated the average value for each CB. The result is a monthly net per capita income in particular CB.

2.3 Shopping orientation

In order to find out shopping orientation, the method of self-determination of shopping characteristic was used in the question: *Tick the characterization that describes your shopping behaviour in the best way* (respondent could read descriptions of particular shopping types). Each respondent should tick just one of these possibilities: A) influenceable – emotive in shopping behaviour, influenced by ads, buys discounted products, high number of purchases during a single day, B) demanding – high demands on quality of goods and shopping comfort, C) mobile pragmatist – optimizes ratio between price and value of goods and prefers large-scale

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stores and travels by car regularly, D) cautious conservative – decides rationally and conservatively, does not trust in ads as well as does not use car and has just low share of impulsive purchases, E) economical – minimizes expenditures, shops only rationally and travels by car just rarely, F) loyal customer – shops often in small amounts of goods, prefers small shops in the vicinity of the place of permanent residence as well as prefers traditional features and likes social aspects of shopping, G) undemanding phlegmatic – does not have any demands on store, does not care about prices, travels for purchases. The first three of abovementioned types form the group of modern shopping orientation and the remaining four create traditional type of shopping orientation.

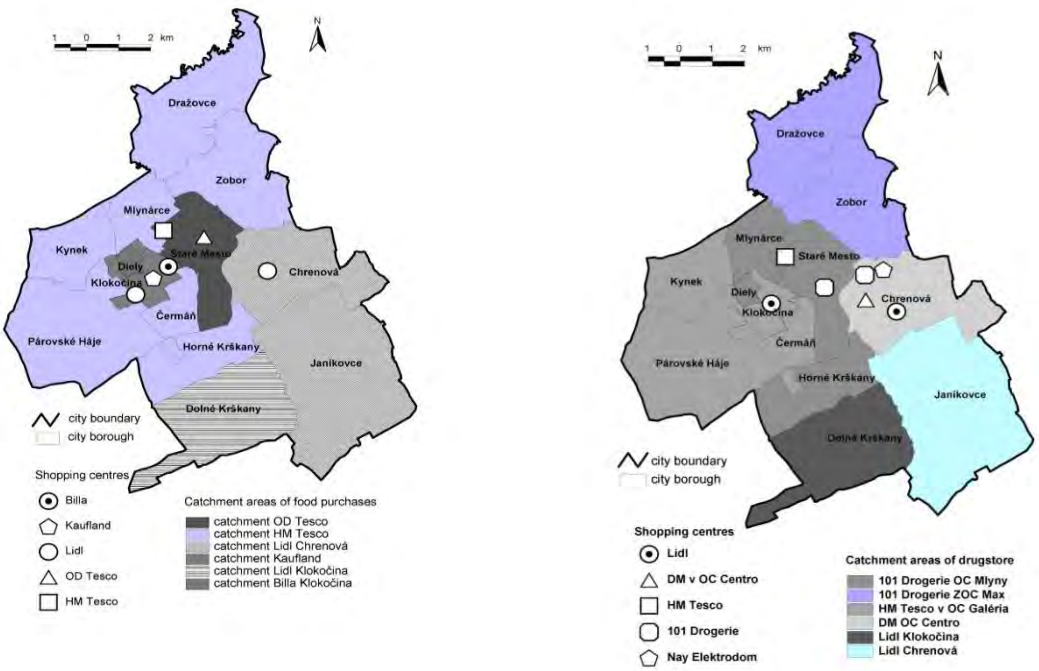
3. Results and discussion

Nitra was the first city in Slovakia, where the first Tesco hypermarket was opened in 1999 (at that time Nitra was the fourth largest city in Slovakia). The highest form of retail network began to develop in large scale after 2005, when a massive boom of construction of shopping centres of third generation occurred, while they were operated by foreign retail chain stores (20 chain stores in 2008, Trembošová, 2010). Even in 2005, just 7 of them had own large-scale retail stores (Tesco – hypermarket and department store, Kaufland, Metro, Billa, Baumax and Lidl). Their number rose to 24 units till 2014. The commencement of financial and economic crisis in 2008 along with the unclear ownership of land caused suspension of the City Park construction in the Pod Tabakovou urban district in Zobor CB.

3.1 Selection of shopping place

In terms of marketing theories, the selection of shopping place is the most frequently analysed domain in shopping behaviour. Based on the identical responses of respondents, we delimited centres of shopping food, drugstore goods, clothes, shoes and other consumer goods (Fig. 1).

Figure 1: Catchment areas of purchases of food and consumer goods



Within the group of purchases of food, six shopping centres (hereinafter referred to as SC) were delimited. The most preferred centre was Tesco hypermarket located inside the Galéria SC. Its catchment area was formed by 7 CB (Mlynárce, Čermáň, Dražovce, Horné Krškany, Kynek,

Párovské Háje and Zobor) represented by 17,457 inhabitants. Lidl in Chrenová had its catchment area created by Janíkovce and Chrenová represented by 17,647 inhabitants. On the other hand, Kaufland hypermarket was the most favourite place for inhabitants of Klokočina and displayed a gravity centre for 20,106 residents. Tesco department store; located at the city centre; was preferred by local residents living in Staré Mesto, where 13,610 inhabitants lived. Lidl in Klokočina was favourable for residents of Dolné Krškany (2,096 persons), while Billa in Klokočina was favoured by inhabitants living in Diely (8,991 persons).

Respondents coming from all city boroughs of Nitra chose Mlyny SC as the most preferred place for shopping clothes and shoes. The best results in purchasing of electrical appliances reached Nay Elektro, which had two stores in Nitra – first one in Chrenová on Chrenovská Street and the second one is located in Klokočina within the Family centre. More variable responses were registered in the group of drugstore goods. According to the identical answers, six centres were profiled (Figure 1). The most significant was Galéria SC because of catchment area consisting of Kynek, Klokočina, Čermáň and Párovské Háje CB represented by 26,948 residents. On the other hand, 101 Drogérie at Mlyny SC had its catchment area formed by four CB (Staré Mesto, Mlyny, Horné Krškany and Diely) represented by 24,118 residents. The third centre was 101 Drogérie at Max SC – typical for people living in Zobor and Dražovce that are summarily represented by 9,220 inhabitants. Drogerie Markt located at Centro Nitra SC was preferred by customers living in Chrenová city borough that was represented by 16,471 people. Remaining two centres were Lidl in Klokočina (preferred also by inhabitants of Dolné Krškany represented by 2,096 residents) and Lidl located in Chrenová that was favoured by inhabitants of Janíkovce, where 1,647 people lived. Answers to following reactions brought findings that almost 40% of questioned respondents living in the Nitra city used to shop 3 – 4 times a week also at bakeries, butcheries and corner shops with offer of fruits and vegetables. Customers usually chose shops located at the place of their residence and they did not travel to large-scale stores purposefully. They were loyal to discounts and advantages, but not to brands. The list of the most preferred chain stores in the field of food was lead by Lidl (24%), followed by Kaufland (24%), Tesco (21%), COOP Jednota (12%), Billa (11%), Nitrazdroj (6%) and others (2%). In terms of purchasing consumer goods, even 87% respondents decided to visit large-scale stores. In case of "white" appliances, respondents preferred chain stores Nay, Okay, Planeo and Mountfield, while in case of furniture, they favoured Merkury Market, Sconto, Black-Red-White and Decodom, whilst drugstore goods were mainly shopped in 101 Drogérie, Tesco hypermarket, Lidl and Drogerie Markt. In the event of purchasing clothes, respondents preferred chains and brands H&M, Gate, F&F, New Yorker, but also Chinese vendors, while shoes were mostly purchased in Deichmann, Humanic, Baťa, CCC, John Garfield as well as by Chinese vendors. Experiences with on-line shopping were ticked by 38% respondents of the sample and they typed especially webpages such as Bazoš, Alza, Ebay or Aliexpress.

We found out differences according to the age. While younger and middle generation used to shop mostly at large-scale stores, respondents older than 60 yrs did not adapt this habit. Members of this category favoured especially smaller retail stores. An interesting fact is that, people above 45 yrs did not shop via Internet. Even 53% of respondents stated that they shopped several times a week, while Friday and Saturday were the most often days. The weakest shopping activity was typical for Sunday, of course. Just 3% of respondents shopped only once or twice a month and they preferred Metro Cash&Carry store.

The most favourite place for shopping for the Nitra city population became Mlyny SC, which was ticked by 45% participants. The second place was dedicated to Galéria SC (16%), followed by Centro Nitra SC (12%). Contrary to that, Max SC was the least favoured centre (8%). In spite of these facts, even 19% of respondents proclaimed that they did not visit any shopping centre. The most important factors affecting respondents in the process of shopping centre

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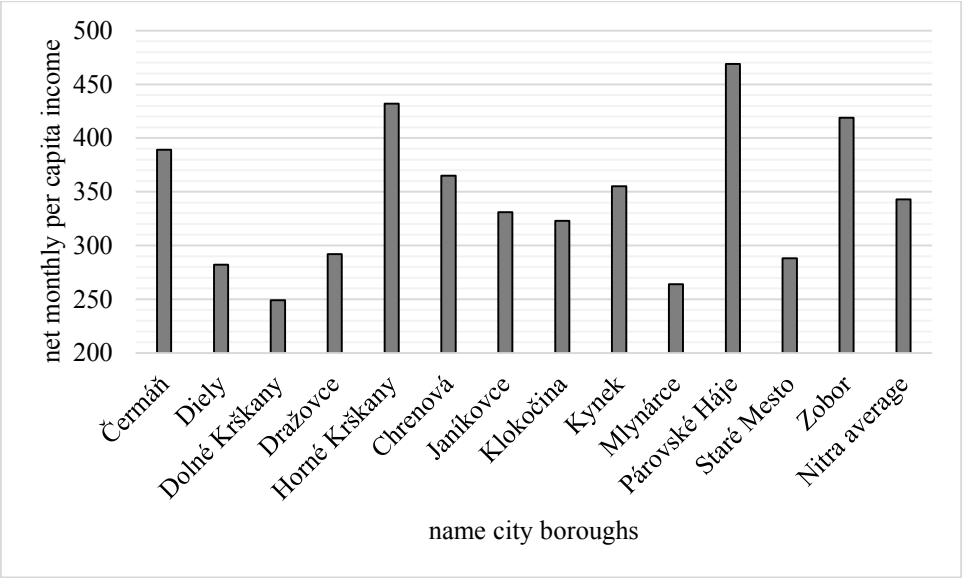
selection were location (70%), atmosphere (14%), opening hours (14%), price level (1.8%) and advertisement (0.2%). The main reasons for shopping activities were purchases of food (52%), consumer goods (89%), drugstore goods (69%) and leisure time activities (6%).

The purchasing power of residents living in each CB was calculated as a multiple of monthly net per capita income (in €) and number of inhabitants, while it reached range from 249€ in Dolné Krškany to 469€ in Provské Háje (Graph 1). The average level for the city as a whole reached 343€ per capita per month. Five city boroughs were presented by higher value – Horné Krškany (432€), Zobor (419€), Čermáň (389€), Chrenová (365€) and Kynek (355€). The living wage in Slovakia in 2014 reached 198.09€ (www.employment.gov.sk) and from this viewpoint, average incomes of Nitra households are two – three times above the mentioned wage.

Graph 1: Average net monthly income per capita in city boroughs of the Nitra city (2014)



Source: questionnaire survey, 2014, n=705

The most significant concentration of purchasing power was in the most populous city boroughs: Klokočina, Chrenová, Staré Mesto, Zobor and Diely. These areas were predetermined for development of retail stores concentrated on the assortment of quick offtake and daily consumption: food, drugstore, pharmaceutical and consumption goods along with shoes and clothes. Contrary to this, highly specialized retail stores associated also with leisure time activities, stores selling "white" appliances and IT machines will direct their stores into localities typical for good transport accessibility, spatial demands on area, storage and parking possibilities, taking into consideration also a synergic factor of location in terms of logistic at the expense of purchasing power of local residents. Such localities are represented by following city boroughs: Mlynárce, Párovské Háje, Kynek and Dolné Krškany (Figure 2).

3.2 Development stages of retail network and shopping behaviour of city residents

During 20 years of research, there were identified qualitative different stages in the development of retail network in the city of Nitra – phases of atomization, consolidation and concentration, demassification (Trembošová, 2012), which affect the model of shopping behaviour of consumers. *The first phase – atomization* – is in fact combined with the situation in retail in centrally planned economy. In this phase, consumer seeks goods, while stores are small and equipped just by basic goods, a range of goods is small, and the prices and goods are the same at all stores, while this phase is typical for more often shopping for daily consumption, less often shopping by car, while purchases are more planned and managed. *The second phase*

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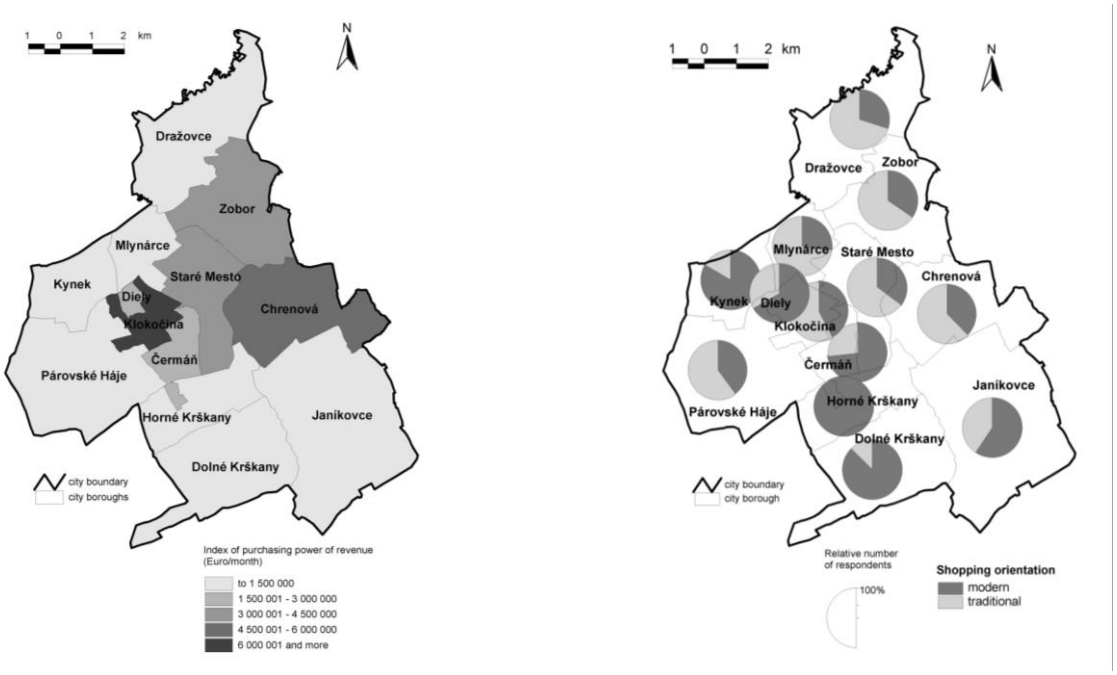
– *consolidation and concentration* – represents the commencement of market economy in retail (goods "are directed" towards consumer – there is sufficiency of goods and wide range), what is associated with the commencement of larger shopping venues (such as supermarkets), while other typical features of this phase are better equipment at city centre as well as at the periphery, popularity of larger complexes is on the increase, more types of stores are within the one complex. In this phase, the frequency of shopping decreases, "weekly purchases" occur, but traditional shopping activities remain during leisure time. *In the third phase – demassification*, the situation is in fact similar to the developed economies. There are adopted not only spatial forms of retail from developed countries, but also consumers shopping behaviour along with new trends (goods towards customers – variety of range and variability, necessity of marketing strategies, discounts and advertisements in meaning "consumer comes first"). At this stage, level of sales areas are on the increase (arrival of large shopping centres), while shopping centres can be marked as a magnet for

Figure 2: Spatial distribution of income purchasing power and shopping orientation of respondents in the city of Nitra (2014)



consumers. There are manifold alternatives to the same product, while purchases are more frequently realized by car, shopping is associated also with other activities such as fun and entertainment, sport, refreshment or meetings with friends (Spilková, 2002).

Within the light of models of shopping behaviour of respondents, the most numerous group was formed by loyal customers (25%; 177 respondents). They were followed by mobile pragmatists, who were represented by 145 (21%) people of the sample, while 17% (117 respondents) belonged to the type of economical customer. There were 83 (12%) respondents correlating with the description of cautious conservative, followed by influenceable customers (73 people; 10%). Just 72 (10%) respondents considered themselves as demanding customers, while the smallest proportion reached the category of undemanding phlegmatic (5%) (Graph 3). According to the prevailing types, the population of the Nitra city is possible to classify to the traditional type of shopping behaviour.

Graph 3: Shopping types and shopping behaviour of the Nitra city population in 2014

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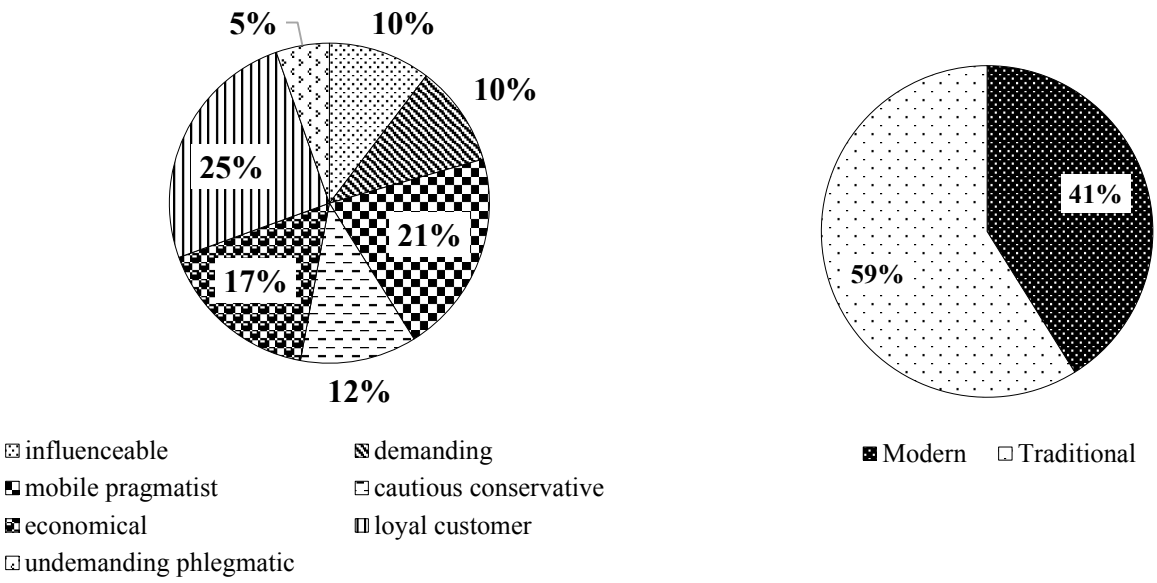

Models of shopping behaviour have its own specific features in each city borough.

Staré Mesto – the average monthly per capita income (hereinafter referred to as "PCI") reached 288€. Respondents used to buy food and drugstore products at Tesco department store (27%), Lidl on Ďurková Street (25%) and Billa at Mlyny SC (14%). They also liked shopping in 101 Drogérie (21%) at Mlyny SC and Nay Elektro (33%) located on Chrenovská Street nearby stadium in Chrenová. Even 56% of them purchased clothes and shoes at Mlyny SC and 16% of them at Galéria SC. Men coming from this city borough stated that they bought clothes and shoes also at the market hall, second hands and Polygon. A car was used by 52% of the sample from this city borough. Within the shopping behaviour, they belonged to the traditional type, while the most of respondents identified themselves as loyal customers (27.9%). The types of shopping behaviour of respondents according to the particular city boroughs of Nitra are depicted in Graph 4.

Graph 4: Shopping orientation of respondents according to the city boroughs of Nitra in 2014

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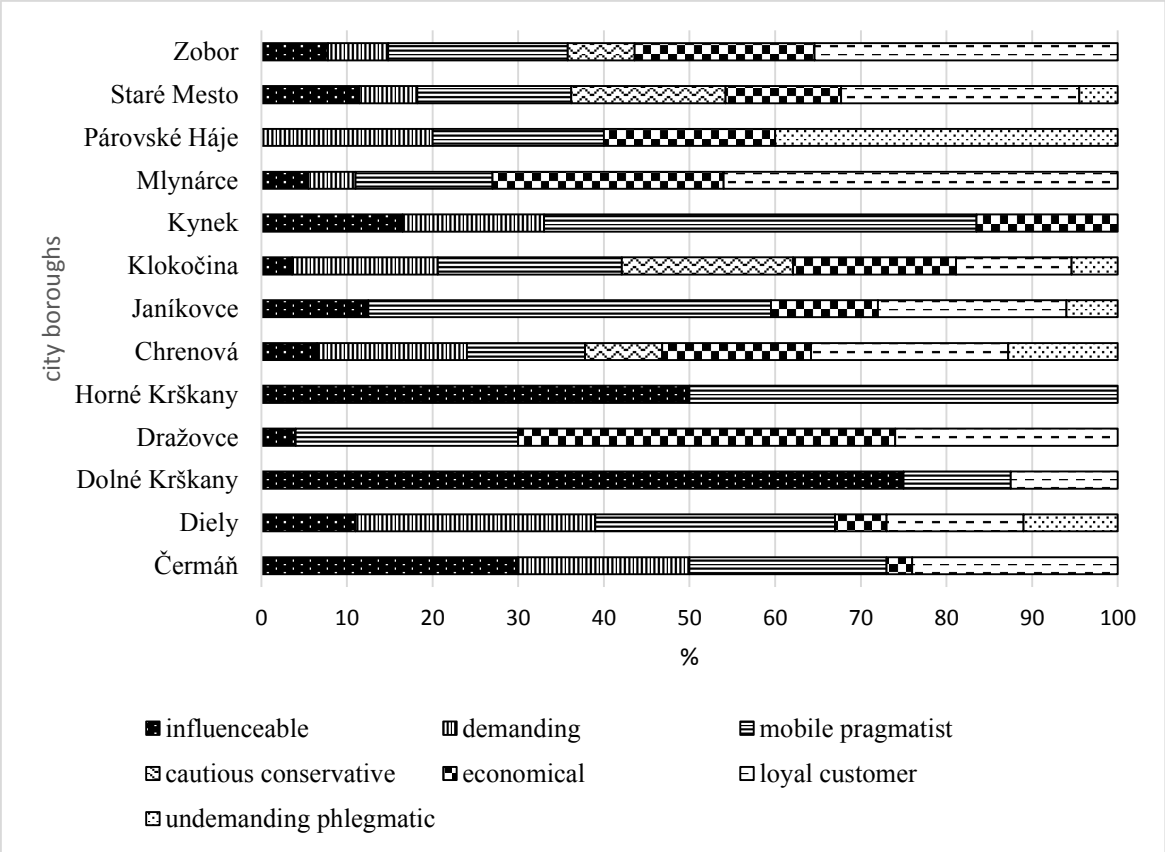

Source: questionnaire survey, 2014, n=705

Mlynárce – PCI reached 264€. Respondents preferred shopping food at Tesco hypermarket located at Galéria SC (28%) and at Kaufland hypermarket (26%) located in Klokočina. Purchases of drugstore goods were preferred in 101 Drogérie at Mlyny SC (23%), Tesco hypermarket (21%) and specialized store of drugstore products called Teta on Štefánik Avenue. Consumer goods were purchased mostly at Nay Elektro in Chrenová (59%). Even 61% of respondents coming from Mlynárce used to shop clothes and shoes at Mlyny SC (19%) and Galéria SC. They also bought food at Metro Cash&Carry (food, drugstore and consumer goods) and at shops located on pedestrian zone (Slovenska and Baťa). Just 33% of them used car as a mean of transport for shopping activities. In terms of shopping behaviour, they belonged to traditional group, while the majority of them identified themselves as loyal customers (46%).

Dražovce – PCI reached 292€. Respondents from this peripheral city borough usually travelled for shopping to Tesco hypermarket (45%) and Billa at Mlyny SC (20%). Even half of them bought drugstore products in 101 Drogérie at Max SC, 45% of them bought electrical appliances at Nay Elektro located in Chrenová, but they shopped clothes and shoes mostly at Mlyny SC (50%), followed by Centro Nitra SC (35%) and Max SC (20%). The vast majority (91%) of the respondents living in Dražovce used car for shopping and they characterized themselves as an economical type with traditional orientation.

Janíkovce – PCI reached 331€. Also these respondents shopped food at Tesco hypermarket (30%) and at Lidl in Chrenová (17%). They bought at these stores also drugstore products, too. On the other hand, they sought consumer goods at Nay Elektro in Chrenová (41%), while clothes and shoes were usually bought at Mlyny SC (24%). Therewithal, they purchased clothes and shoes also in Poland, Vienna (Austria), on pedestrian zone in Nitra and also from various catalogues. Even 15% of them looked for these goods at the market hall. Car was used for shopping by 80% of participants. In terms of shopping behaviour, even 72% of them belonged

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to the category of mobile pragmatist and thus they represented a modern type of shopping behaviour.

Klokočina – PCI reached 323€. People living in the most populous city borough in Nitra bought food in variety of stores (total 10 stores). They preferred mostly Kaufland hypermarket in Klokočina, followed by Tesco hypermarket (28%) and Lidl in Klokočina (16%). Drugstore goods were usually shopped at Tesco Hypermarket (43%) and Drogerie Market (in Klokočina; 21%). Consumer goods were bought at Nay Elektro in Klokočina (40%), while clothes and shoes were bought at Mlyny SC (53%). Travelling by car was more preferred (64%) than public transport or walking. These respondents reached almost balanced ratio between modern and traditional types, while the majority of them were mobile pragmatists (21.5%), followed by cautious conservatives (20%).

Chrenová – PCI reached 365€, while it was the second most populous city borough in Nitra. Food was commonly purchased at Lidl in Chrenová (25%), followed by Jednota department store (19%) and Tesco hypermarket (17%). Drugstore goods were preferably bought at Tesco hypermarket (22%), Drogerie Markt at Centro Nitra SC (18%) and 101 Drogérie at the same SC (15%). People living in this city borough used to shop consumer goods at Nay Elektro in Chrenová (33%) and Datart at Centro Nitra SC (26%). On the other hand, participants usually bought clothes and shoes at Mlyny SC (63%) and Centro Nitra SC (15%). Cars were used for transportation purposes by 58% respondents. Within the light of shopping behaviour, economical type of consumer dominated (23%), thus traditional type of behaviour prevailed, too.

Horné Krškany – PCI reached 432€. Respondents used to shop food at Tesco hypermarket (70%), while purchases of drugstore goods were mostly realized in 101 Drogérie at Mlyny SC (40%) and Drogerie Markt in Klokočina (30%). Consumer goods were bought at Nay Elektro in Klokočina (60%). People coming from Horné Krškany bought clothes and shoes mostly at Mlyny SC (72%) and via on-line shops. They used car (50%) and public transport (50%) for shopping at the same level. There was registered a noticeable ratio between influenceable type (50%) of consumer and mobile pragmatist (50%) and therefore they belonged to the modern type of shopping behaviour.

Dolné Krškany – PCI reached just 249€. Respondents coming from this city borough were typical for the lowest level of average monthly per capita income. They looked for food mostly at Lidl (40%) and Billa (40%) in Klokočina, while Lidl was preferable also for purchases of drugstore goods (60%). On the other hand, consumer goods were often bought at Nay Elektro (60%) in Klokočina, while Mlyny SC was preferred for clothes and shoes (80%). Not only did they use car (50%) as a mean of transport, but public transport (50%) as well. Respondents showed modern shopping behaviour, because 75% were influenced by ads and just 12.5% were mobile pragmatists.

Kynek – PCI reached 355€. Respondents living in this peripheral city borough looked for food exclusively at Tesco hypermarket, where they bought also drugstore goods. On the other hand, consumer goods were sought just at Nay Elektro in Klokočina. The preferred shopping place for purchasing clothes and shoes became Mlyny SC or capital of Austria, Vienna. The slight majority (51%) used a car for shopping. In terms of shopping behaviour, they belonged to modern type, while the most of them (51%) was characterized as mobile pragmatists, followed by demanding type of customer (16.5%).

Diely – PCI reached 282€. Participants bought food at Billa in Klokočina (21%) and the same proportion reached Jednota store also in Klokočina. Drugstore goods were often bought in 101 Drogérie located within Mlyny SC (50%), consumer goods at Nay Elektro in Klokočina (60%), clothes and shoes at Mlyny SC (65%). Approximately the two thirds of respondents (66%) used

own car for shopping. Within the shopping behaviour, they were characterized by modern behaviour, because the highest share (28%) was typical for demanding consumers as well as mobile pragmatists.

Párovské Háje – PCI reached 469€. Respondents bought all of the goods only at Tesco hypermarket (food 33%, drugstore goods 100%, consumer goods 63%, clothes and shoes 47%). All of them also used own car for shopping activities. In terms of shopping behaviour, they were typical for traditional orientation, because undemanding phlegmatic (40%) along with economical consumer (20%) formed the majority of participants.

Zobor – PCI reached 419€. Respondents looked for food mostly at Tesco hypermarket (41%) followed by Terno COOP at Max SC (20%). People living in Zobor shopped at Metro Cash&Carry the most often of all city boroughs (14%). They conducted there also purchases of drugstore and consumer goods. Moreover, they sought drugstore goods also at 101 Drogérie within Max SC (29%). The most preferred place for shopping of consumer goods became Nay Elektro in Chrenová (39%), while 8% of them bought these items abroad. The most favourite place for shopping clothes and shoes was Mlyny SC (55%), shopping abroad or at shops on pedestrian zone. More than three quarters (76%) of respondents travelled by car (76%) and just 22% used public transport. They were typical for traditional orientation of shopping behaviour, as the most of them were loyal customers (36%) and economical type of customers (21%).

4. Conclusion

Consumers shopping behaviour is a significant sociological phenomenon that is understood as a sign of consumer lifestyle greatly influenced by society in which the consumer uses goods and services. The level of consumer behaviour is affected by spatial availability of goods, shopping culture, offer of shopping concepts, real household income, lifestyle as well as marketing activities of sellers. It affects not only the economy, but also it has significant social and cultural impacts.

Shopping behaviour of the Nitra city population and its boroughs was examined according to the questionnaire survey that was divided into two sections. The first one was dedicated to the choice of shopping place, while the second one was devoted to the shopping orientation based on the fact that different shopping behaviour divides customers into various groups, what was confirmed in particular city boroughs.

The most common (average) respondent of the survey was a woman at the age from 40 to 49 yrs with secondary education, who was employed with monthly net income from 801 to 1,200€. In accordance with the obtained answers, the majority of questioned respondents shopped food 3 or 4 times a week at bakeries, butcheries or corner shops with offer of fruits and vegetables. Customers usually chose stores located in the vicinity and do not purposefully travel to large-scale retail centres. Contrary to that, even 87% of the sample purchased consumer goods just at large-scale stores, especially “white” appliances, clothes and shoes. Respondents older than 60 yrs were not used to shop at the large-scale stores (shopping centres, supermarkets or hypermarkets), thus they preferred smaller retail stores. The category of participants above 45 yrs was associated with feature that they did not shop via Internet.

The selection of shopping place is the most frequently analysed domain within shopping behaviour. According to the identical response of respondents, six shopping centres were delimited for purchasing of food. In terms of spatial variable, Tesco hypermarket within Galéria SC had the largest catchment area (7 boroughs represented by 17,457 residents). On the other hand, Kaufland hypermarket was typical for the strongest gravity centre, because its catchment

area consisted of 20,106 inhabitants living in Klokočina. In case of consumer goods, there were registered more variable answers and 8 catchment centres were formed.

According to the results along with the long-term research in the field of consumers shopping behaviour in the Nitra city, there may be highlighted a noteworthy fact that based on the objective assessment, such as travelling by car (confirmed by 66% participants), preferred shopping centres (even in case of consumer goods, clothes and shoes reached 87%) and behavioural surveys realized in 2004 and 2008, the population of the Nitra city was typical for modern behaviour, while subjective self-assessment by respondents in 2014 did not confirm those statements, but, contrary to that, it showed a traditional orientation in shopping.

Within the model of shopping behaviour of respondents, the most numerous group was formed by loyal type of customers (25%; 177 respondents), followed by mobile pragmatists, whose description was suitable for 145 (21%) respondents, while 17% (117 of them) represented an economical type of consumer. There were also 12% (83 participants) cautious conservatives, who were followed by influenceable ones (10%; 73 respondents). The category of demanding customers consisted of 72 questioned people (10%), while just 5% represented the type of undemanding phlegmatic. Based on the prevailing types, the population of the Nitra city belonged to the traditional type of shopping behaviour. Traditional shopping orientation was preferred by 59% of the sample, while modern orientation was confirmed just by 41% of participants.

In terms of shopping orientation within the each city borough of Nitra, certain number of respondents characterized themselves as mobile pragmatists (belonging to modern orientation) and thus this type became spatially most widespread. Remaining types did not have proportion in each city borough. The lowest spatial variability was typical for "cautious conservatives", who were registered just in four city boroughs.

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Boomerang effect of a negative campaign – a case study from the market of beverages

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Abstract
Negative campaigning or "mudslinging" is a technique to win an advantage by referring to negative aspects of a competitor rather than emphasizing one's own positive attributes (Wikipedia, 2016). It is well known in politics, but "dirty tricks" can be adopted trying to improve one's position on a well-defined market. Our paper introduces a case study of a negative campaign which targeted the largest national soft drink producer of Angola, Refriango.
Nine weeks after the outbreak of an SMS campaign of a suspected contamination of its products, we asked 500 people to fill in a questionnaire with the aim to measure the effects of the attack on consumer behaviour. Our results have shown that the unidentified attacker managed to provoke uncertainty among consumers. Nevertheless, by denying the allegations and using a rapid remedial campaign, the attacked firm succeeded in restoring its image and position on the market Above all these, by becoming known among wider range of the population, they could even increase the number of their consumers. We could demonstrate the boomerang effect of the negative campaign.

Keywords: *Angola, beverage consumption, consumer behaviour, negative campaign.*

JEL Classification: *M31*

1. Introduction

During recent decades consumers got used to get more and more information about great variety of products and services every day.

Most of these contain positive content, referring to positive aspects of the product or service, but fierce competition in the market can lead businesses to use different techniques to get attention, gain more market share and profit among their competitors.

Negative marketing is a strategy used in order to make one's product look better than the others proving that the other one is bad. While some people may find this to be unfair or unethical it is a marketing strategy used all the time, because it really seems to work. This type of marketing is aggressive, that is why there seem to be so many hard feelings of it. Those who apply, term it as "comparative marketing", that way the firm cannot be accused of trying to destroy the business of someone else. Nevertheless the method is only for a company that consumers have grown to trust, without it they will not listen to what they say.

The information offered with negative marketing tends to remain with the consumer for a very long time. They won't easily forget the message that captured their attention and that gets results for the advertiser and increases sales. With hard economic times many businesses consider to use those methods of advertising that are going to generate sales for them (Anonymous, 2016).

1.1 The market of soft drinks in Angola

According to the results of a survey completed by the AC Nielsen Company in 2012, the market of non-alcoholic drinks had an estimated 2.3 billion dollar value, with an increase of 6 per cent a year. This means an estimated 3 million litres of various types of soft drinks, including

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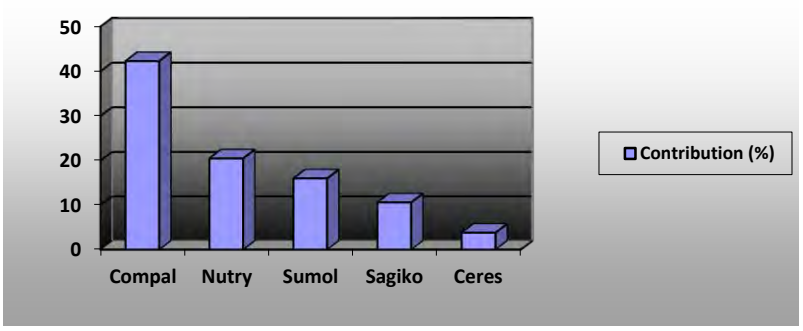
carbonated soft drink, water, juice, tonic, dairy products, energy drink, hot drinks and sport drinks, per year. The most consumed of these categories are carbonated soft drinks, with an estimated 60 per cent share (1 800 000 litre) followed by juices with 28 per cent (850 000 litre). There is a substantial preference towards carbonated soft drinks, and this is the main market for the Coca-Cola Company with a share of 62 per cent. We have to mention, that Coca-Cola is not represented in other sectors of soft drinks. Juice market is shared mostly by five competitors, shown in **Figure 1**. Among others, the only national producer of juices, Refriango turns up second place with its brand Nutry (Vemba, 2012).

Figure 1: Major participants of the juice market in Angola (prevision for 2012)



Source: AC Nielsen study for the Coca-Cola Company – Prevision for 2012 (Vemba, 2012).

1.1.1 Brief history of Refriango

The most successful and fastest growing company of the national food industry was founded in 1992 as Acorango. Initially traded with beverages imported from Portugal, its first repository was located close to the Port of Luanda. Six years later the first manufacturing plant started producing alcoholic drinks as Abastango, applying the latest technology and equipment, with a capacity of 60 000 bottles of vine a day by its own brands, Gaivota and Encosta. The success established their further development. In 2004 the firm already had three different sub-units:

1. Abastango – sub-unit for bottling vine;
2. Luanday – changing Acorango, responsible for logistics, distribution and human resource management;
3. Refriango – sub-unit for producing soft drinks.

New brands were introduced the following years (Blue, American Cola, Sangria Tropicana, Dom Cacho) could easily conquer the Angolan market. Brand "Blue" received a prestigious recognition in Europe, winning gold prize of an international food quality competition of the Monde Institute in Brussels (AngolaBela, 2014).

The firm continued its expansion. On the 10th of November 2005, the country's prime minister officially opened the new manufacturing plant built on a four hectare territory, with an investment of 40 million USD in Kikuxi district, Luanda. It was capable of producing on ten product lines, giving work to 1476 employees.

The expanded product lines according to Refriango homepage (2016) as follows:

- Vines: Gaivota, Dom Cacho, Alentejo;
- Mineral water: Água Pura;

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- Carbonated soft drinks: American Cola, Red Cola, Sangria Tropicana, Blue, Blue Polpa, Twist
- Tonic: Welwitschia;
- Ice tea: N'ice Tea;
- Juices: Nutry, Tutti, Super Cuia;
- Energy drink: Speed.
- Sport drink: Pura Sport

The company moved toward internationalization, first exporting to neighbouring countries and to Portugal. The fast development excited significant changes in market share of beverages. No one could predict, what came next.

1.1.2 Launching an Attack on Refriango

On the 25th of October, 2013 an unidentified source launched an SMS campaign sending the same message to tens of thousands of cell phones with the following content:

"Urgent message to everyone. The following days do not drink any brand of Refriango, for example Blue, Água Pura, Red Cola, Nutry juice, etc. One employee of the company has contaminated these, introducing his blood infected with AIDS…Follow TPA. Send this message to as many people as possible."

The following days the news spread across the country. Shortly after, the National Institute for Consumer Defence (INADEC) replied with another message, declaring: "The message about contamination of national drinks are false. Trust your country. What is national, it is good, and have quality. Message of INADEC, the National Institute for Consumer Defence."

Refriango itself also responded to the allegations sending SMS to mobile phones, appearing on television, in radio programmes and advertisements also declaring: "The message about contamination of brands of Refriango was false. There is no risk of consume, trust us and defend the truth, share this message. Refriango - Passion for Angola."

1.2 Hypothesis

Nine weeks after the allegation, we put up a questionnaire examining the effect of the negative campaign on the population of the capital city, Luanda. We set up two different hypotheses for the possible effects of the campaign.

- Hypothesis 0: we would not reveal any considerable changes of consumer behavior, because the image of the company is stable, consumers trust the quality of their products.
- Hypothesis 1: due to negative campaign a considerable number of consumers relate their experience of uncertainty and becoming cautious or even stop consuming the brands of the accused company.

2. Data and Methods

We conducted our quantitative research on the 7th of June, 2013 nine weeks after the campaign broke out. Our questionnaire consisted of two opening questions (gender and age), five close, structured questions about the message, how did the answerers felt about it, and also about its effect on their behaviour. The sixth question was an open one about the preferred brand of soft drinks.

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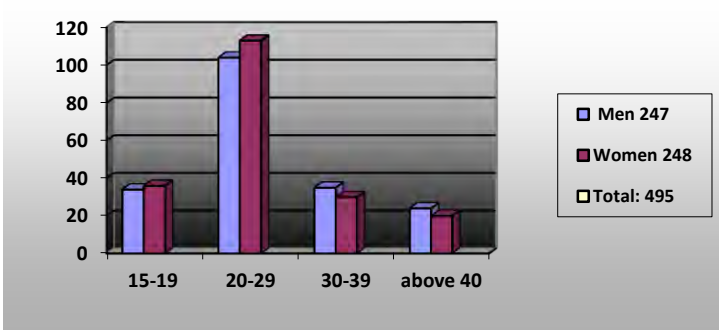
We conducted face-to-face questioning using paper based method. The fieldwork was performed on various locations of the capital city, Luanda, in streets, markets, schools, a university, churches and supermarkets. The interviewers were fourth year students of the Faculty of Economy and Social Sciences of University Jean Piaget. The sampling size was 500 people using simple random sampling method. The data were processed manually and the main results are shown as tables and diagrams edited applying Microsoft Word 2010 (Gyulavári, Mitev, Neulinger, Neumann-Bódi, Simon & Szűcs, 2012).

3. Results and Discussion

3.1 Age and Gender distribution

The answers to our opening questions are shown in **Figure 2** demonstrating the age and gender distribution of the respondents. Four of them did not give an age and the one under 15 was excluded. The diagram is not representative for the population pyramid but refers to the majority of young persons in society.

Figure 2: Age and sex distribution among respondents



Source: results of our survey 07/06/2013

3.2 Results

First we asked whether the respondent was aware of the message of contamination regarding to products of Refriango. The results showed a very high 95 per cent (475 of 500) awareness. Our second question tried to find out how many of them had received the cited message on their mobile phones. We measured a 79.6 per cent positive (398 of 500) and a 20.4 per cent negative (102 of 500) response. This means that the unidentified attacker directly or indirectly managed to reach about 80 per cent of telephone owners at least in the capital city. Through the third question we could evaluate the consumer group of Refriango. According to Marktest Angola, in 2011 90 per cent of residents of Luanda consumed soft drinks regularly Vemba, 2012). Our questionnaire showed 81.8 per cent (409 of 500) consume of brands of Refriango. Among non-users we could find a higher per cent of men (64 per cent) than women (36 per cent). Probably a higher percentage of men prefer drinks containing alcohol.

The fourth question allowed four different answers about the first reaction of respondents after learning the news about a possible contamination, shown in **Figure 3**. We divided the four possibilities to two similar groups. The “optimists” or “confidents” (those who did not believe the accusations and those who continued consuming, whether they believed it or not), and the “pessimists” or “skeptics” (those who wanted evidence and those who panicked). Our results are shown in **Figure 4.**

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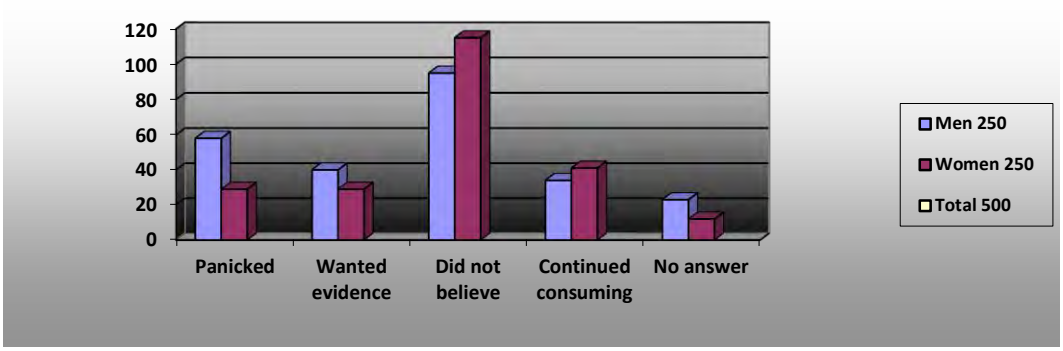
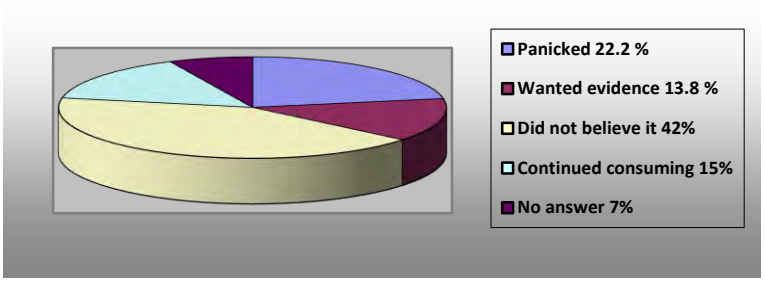
Figure 3: Distribution of answers (N) by gender to question 4



Source: results of our survey 07/06/2013

Figure 4: Distribution of answers (%) to question 4



Source: results of our survey 07/06/2013

Analysing the answers to the fifth question we were able to recognize the real actions of respondents after remedial campaign. Comparing the results with the answers to the fourth question, we could find that in the optimist group consumers did not change their consuming habits they continued buying soft drinks of the company.

On the other hand in the group of skeptics (180 of 500) only 54 (30 per cent of skeptics) never stopped consuming despite their confusion and fears, 118 of them (65.5 per cent of skeptics) stopped for a while but then returned to consumption. 7 persons of those who felt panicked and 1 person of those wanted evidence declared they stopped consuming (4.4 per cent of skeptics).

After the declaration of INADEC and Refriango, to our surprise we could discover 14 new persons among the former 91 non-consumers declaring they started buying soft drinks of Refriango. So after losing 8 and gaining 14 consumers, the number of consumers increased to 415 of 500 (83 per cent), which is a 1.2 per cent growth comparing to the 81.8 per cent consumption before the negative campaign. We could find a trend of increasing consumption.

3.3 Preferred brands of soft drinks among respondents

With our sixth question we tried to measure the preferences of soft drinks. Naturally, as we were asking questions in connection with one certain company, the answers were bent to this direction as shown in **Table 1**. Some of the respondents gave multiple answers, we took into consideration the first and second of their preferences (500 persons, 529 answers). Our results confirm the findings of the AC Nielsen Group cited by Vemba (2012) about the huge advantage of carbonated soft drinks ahead of juices or even mineral water. We could reveal the strongest competitors of these segments of the market as well.

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Table 1: Preferred soft drinks among survey respondents

Company	Sector	Brand	Preference	Total sectorial	Total of 529	Total %
Refriango	Mineral water	Água Pura	65	65	428	80.9
	Tonic	Welwitshia	1	1		
	Juice	Nutry	68	123		
		Tutti	55			
	Carbonated soft drinks	Blue	234	239		
		Red Cola	2			
		American Cola	3			
Coca-Cola	Carbonated soft drinks	Coca-Cola	12	25	25	4.7
		Fanta	12			
		Sprite	1			
Sumol	Carbonated soft drinks	Sumol	8	8	8	1,5
Compal	Juice	Compal	5	5	5	1
Sagiko	Carbonated soft drinks	Sagiko	-	-	-	-
Ceres	Juice	Ceres	-	-	-	-
No answer					63	11.9

Source: results of our survey 07/06/2013

4. Conclusion

People form specific beliefs and attitudes, and those affect their consuming behaviour (Kotler, 2002). Attitude is a cognitive evaluation with emotional content and also a tendency for action (Krech, Crushfield & Ballachey, 1962). It can express the like or dislike, the pursuit of the same or the opposite direction of a subject or an idea. The attitude of a person is based on a consistent pattern (Kotler, 2002). It is part of a matrix of connecting attitudes, that's why it is a very complicated task to change it. Individual values reflect the lifestyle, purchasing behaviour and decisions of consumers. New trends of consumption shows, that status fortifying and demonstrative aspect have been getting stronger as well (Lehota, Manuel & Rácz, 2014).

Companies have to accept market competition with specific balance of power where new competitors always arise. Companies who are attacking their competitors may gain advantage and increase their share, but ignoring consumer attitude and preferences can lead their actions turn back against them eroding long term competitive position.

Results of our research, shows the controversial outcome attacking an emerging company, especially the largest of the national food industry. Our hypothesis 0 proved to be false, and hypothesis 1 could not predict the outcome thoroughly either. It justified the consequences for only a few weeks, but could not see much further to realize the positive attitude and support around. The allegations put Refriango to the centre of interest for weeks, and even those who did not know anything of its existence could recognise their brands after the attack. INADEC expressed quality assurance and solidarity, and the company itself had the opportunity to appear on the national media and disprove allegations. The reception of their statements was positive

so they could restore their image turning hesitants back. And above all these they could even improve their performance reversing the trend after the campaign gaining new consumers.

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Appendix

Questionnaire
Refriango and a conflict generating message in March 2013

Group: _____ Gender Male ___ Female ___ Age ___

1. Have you heard about the message about Refriango product contamination?

YES ___ NO ___

2. Did you receive the message?

YES ___ NO ___

3. Did you consume Refriango products before the message?

YES ___ NO ___

4. What was your attitude after getting the information?

I got into a panic ___ I did not believe it ___

I needed certification ____ I continued consuming ___

5. How did you act after the declaration of Refriango?

I continued consuming ___ I did not consume any more ___

I did not change my behaviour ___ I started consuming ___ I

6. Which brand of soft drink do you prefer and consume most?

Interviewer: _____ N° of Questionnaire ____

SESSION 11

Market research, new technologies and interdisciplinary approaches – organized session within FOODCOST international workshop „*Bridging traditions with novelties*“

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Time factor as one of the aspect that influences shopping in the food stores

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Abstract
The consumer purchasing behavior is changing every year due to the development of information, communication technologies and due to the influence of micro-moments, i.e., the amount of time in selecting, decision and purchasing of products or services. The buying in the shop accelerated and some customers spend less time in the shop, because before buying in the store, some of them have done detailed research on the Internet. The process of buying decisions, and factors which affecting on consumer preferences, the purchase itself to shopping evaluation of the usefulness of a product or service are a part of theory, which is called "consumer behavior". The decision about the purchase of goods depends on the number of various cases of individual factors, of consumer´s perception, environmental factors, the environment in which he lives, or on the people with them he meets. To the factors that have a dominant influence on the decision-making process and ultimately on the purchase of goods also belong the situational factors too, such as time spent for buying. Time is a factor that is important, as for the seller, as well as for the customer. The customer satisfaction plays an important role for the seller, which is a defined by living up to his needs and wishes and whose achievement is nowadays becoming more and more challenging. On the one side, he must constantly expand the product range and create conditions for cultural, experiential purchase, which is a form of relaxation and on the other side, he adjusts the location of daily consumption goods, so that their purchase has been possible to realize as soon as possible and also to operate the cash register systems in such a way, that the more hurried customers were discouraged from other purchases. The aim of this paper is through questionnaire survey and time experiments to evaluate the importance of time by selecting of food shops in chosen retail food stores. Based on the results, in conclusion of this paper we suggest the possible solutions that could contribute to greater customer satisfaction and customer loyalty to individual food stores depending on the form of purchase.

Key words: *consumer decision, food store, shop layout, time factor*

JEL classification: *M31*

1. Introduction

Consumer Behavior and Its Factors

Shiffman and Kanuk (2004) define the consumer behavior as the behavior that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs. It focuses on how individual consumers and families or households make decisions to spend their available resources on consumption-related items. (Horská & Paluchová et.al., 2011) in our behavior it is included what, why, when, where and how often the items are purchased, how often they use them as their value after the purchase, and impact evaluation to the future purchases, and how to treat it. Chartrand (2005) presents, the fact that the needs and desires of consumers and their environment is constantly changing, and the fact that the same marketing strategies may not be successful in every season and in every market, underlines the necessity to deal with the examination of consumer behavior. Richterová (2007) presents, that the object of consumer behavior examination becomes an exploration of *what consumers buy, why they buy, and how, when, where and how often they buy it*. The most serious are two issues, namely how and why consumers make decisions about

buying products and services. (Hodkinson & Ford & Foxall, 2011) another reason for consumer behavior examining is to acquire the knowledge about how consumers behave after the purchase as a value in consumption. These findings provide marketers the information about consumer willingness to implement repeat purchase, or how often and why buy a variety of alternative products etc. (Steffens, 2002). Unless marketing workers want timely response to major trends, and yet achieve the best results, it must continue to examine the target consumer group, its behavior in the market, as well as changes in the factors affecting it (Benda Prokeinová & Paluchová, 2014). Consumer purchasing decisions are heavily influenced by cultural, social, personal and psychological factors, which in most cases, the marketers can´t form themselves, but it is necessary that they take into account (Kotler & Armstrong, 2004). Solomon (2011) define other dividing of factors that affect consumer behavior, there are these three impact categories: *internal effects* (perception, motivation, learning, attitudes, personality, age group, and lifestyle), *social influences* (culture, subculture, social class, group affiliation), and *situational influences* (physical environment, time).

Time Factor in Consumer Behavior

Some of the fundamental dimensions of consumer behavior may be summarized by the factor time. In a way, time and money are interchangeable since time may be converted into money by working, and household appliances and cars have often the function of saving time (Garretson & Mauser, 1963). Jacoby, Szybillo and Berning (1976) presents time is both and antecedent to and a consequence of purchase. Consumers not only spend time and money to acquire products and services but also often use time as a substitute for money and vice versa. Purchase of daily consumer goods average Slovak spends two to three hours per week, representing more than 100 hours a year. The customers spend per purchase in the store from 18.5 to 39.8 minutes, depending on the size of retail chain (Gfk Slovakia, 2012). Slovaks increasingly enjoy shopping. In average, they spend for food shopping almost three hours a week. Thus, per year they spent in the store for six days (Ipsos Agency, 2015). Therefore, time may be used as a common denominator in the economic behavior of households. A time-expenditure approach to consumer behavior means viewing consumer behavior as a household management area in which members of the household interact and allocate tasks to maximize satisfaction of the input of the scarce resource time (or its equivalent money). Such an approach deviates much from the dominant stimulus-response, effects-of-the-marketing-mix research tradition in consumer behavior in which the consumer is positioned as a passive target for marketers' efforts (Okada & Hoch, 2004).

2. Data and Methods

Data and sources:

- *Primary:* the perception and importance of time factor which affects a consumer by retail choosing in Slovakia was measured through data collecting with using of questionnaire in November and December 2015. In these retail chains, we addressed the random customers.
- *Secondary:* citation from Scientifics researchers, papers and books in the topic of consumer behavior, time factor and store layout.

Object of our research:

- The sample are 40 customers (see Table 1), but five questionnaires was selected because of their incorrect completion, so it´s mean that the sample is reduced in 35 respondents.

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Table 1: Structure of Addressed Respondents

Age/ Gender	Man	Woman
18 - 24 years	12	6
25 - 49 years	7	5
50 - 64 years	1	2
Together	20	13

Source: own research

Place of research:

- The research was mostly realized in stores in Western regions of Slovakia and in the different store formats (small food store, supermarket, hypermarket and discount).
- Following in 43 stores of different formats (see Table 2) was always done the same purchase of five items (1 piece of milk, 1 bottle of white wine, 1 piece of bread, 2 pieces of chocolates, 5 pieces of apples). The goal is to measurement the time, which is needed for purchasing realization.

Table 2: The List of Stores 'Samples, in which the Spending Time of Purchase Was Measured

Sales format	Absolute Frequency	Relative Frequency
Food store (small up to 400 m^2)	8	19 %
Discount store	11	26 %
Supermarket	11	26 %
Hypermarket	13	30 %
Together	43	100

Source: own research

Methods:

- Questionnaire directly done in different retail chains. It contents five questions.
- Descriptive (frequencies, quantiles, averages), and inductive (Chi-quadrat test) statistics. Rimarcik (2007) define: these tests verify that the differences may be actual and expected frequencies only random (variables are independent) or are too large to be only random (no relationship between variables).

We´ve set two hypotheses, they are following:

First:

- H0: Quantities are independent. There is not a relationship between gender and spending time in the stores for *daily shopping*.
- H1: Quantities are independent. There is a relationship between gender and spending time in the stores for *daily shopping*.

Second:

- H0: Quantities are independent. There is not a relationship between gender and spending time in the stores for *huge/ thought-out shopping.*
- H1: Quantities are independent. There is a relationship between gender and spending time in the stores for *huge/ thought-out shopping*.

3. Results and Discussion

The survey Barometer Cetelem (2015) shows, time spent for purchases are growing thanks to the Internet. The time spent in the store has decreased for nearly 40 % of Europeans; the Internet

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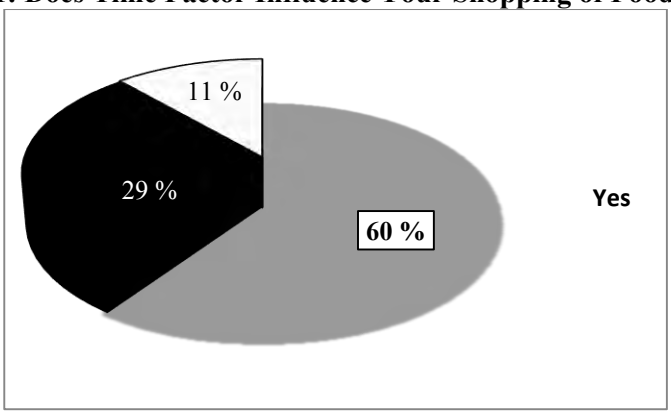
has increased for each type of consumer. Time to shop is reduced and new trend called *"drive"* is increasing (fast shopping, by car, under one roof and close home). These are the basic reasons why the time is pressing for customers when choosing a food store. On Figure 1, we see that more than 60 % of respondents are influences by time in their purchase decision making.

Figure 1: Does Time Factor Influence Your Shopping of Food?



Source: own research

Based on the evaluation of the importance of various factors that influence the selection of shops it can be seen in Table 3, the most important factors deciding the selection of retail. The respondents consider the location and sales format. On the contrary, a conscious evaluation considered the least critical factors as sales staff, store atmosphere and new technologies (e.g. self-service cash registers, electronic tags, delivery home, QR codes, etc.).

Table 3: Factors Ranking by Importance

	Factor						
	Sales format	*Store size*	*Location*	*Store layout*	*Store atmosphere*	*New technologies*	*Staff*
Min	1	1	1	1	1	1	1
25% quantile	2	2	1	2	3	4	3
50% quantile	3	3	3	4	5	6	5
75% quantile	4	5	4	6	6	6	6
Max	7	7	6	7	7	7	7
Ranking	**1-2.**	**3.**	**1-2.**	**4.**	**5-6.**	**7.**	**5-6.**

Source: own research

The verification of established hypotheses showed that for the first hypothesis, we assumed that there is a relationship between gender and time spent in shops for daily purchases. The difference in time spent between men and women is shown graphically on Figure 2. It is perceived by most, that women usually spend longer time in shopping compared to men, who prefers to step into the shop, search for particular product they have in mind, purchase it as quick as possible (unmindful of slight variations that lead to bit expensive purchases), leave immediately. Women, on the other hand, searches patiently for the kind of products in all available brands, compare the designs, checking for any offers available (unmindful of the long time they indulge in selecting a product of their choice), bargaining and end up purchasing the product to their utmost satisfaction. In Figure 2, most men buying over 0 - 10 minutes, women buy 11 - 20 minutes. Men buy for their needs and women shop for their wants. This dependence

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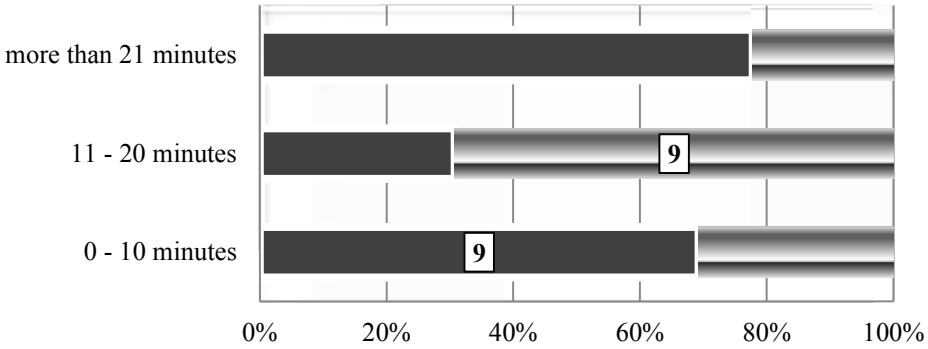
was verified by using the Chi-square test of independence at a significance level of 0.05, with the hypothesis about the dependence of those attributes was confirmed.

Figure 2: Dependence between Gender and Spending Time with *Daily Purchases*

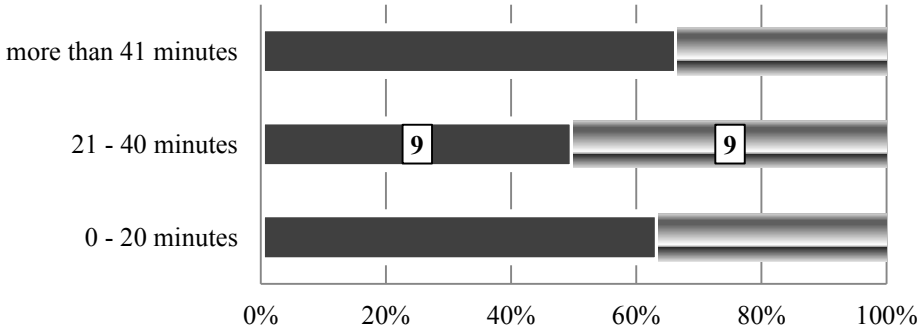


	0 - 10 minutes	11 - 20 minutes	more than 21 minutes
man	9	4	7
woman	4	9	2

Source: own research

Also, we wanted to verify that gender is linked with a huge/ thought-out shopping (see Figure 3). Again, the hypothesis is tested according to the attributes of the significance level of 0.05 using Chi-square test was confirmed.

Figure 3: Dependence between Gender and Time Spending with *Huge/ Thought-Out Purchases*



	0 - 20 minutes	21 - 40 minutes	more than 41 minutes
man	7	9	4
woman	4	9	2

Source: own research

On the basis of average times and same purchases, it can be seen in Figure 4, the longest average purchase was realized in discounts. On the contrary, the shortest was in small food stores to 400 m^2.

The reason of shorter average time for shopping in the comparison between hypermarkets and supermarkets is a fact, that the most realized purchases were done without shopping trolley, which greatly shortened the measured times. Overall, when the value of time spent on buying, hypermarkets induce customers in the subconscious idea that there are goods look more and more purchases in that there is a great selection and huge shopping area. When a customer in the store can choose from lots of small baskets will automatically be shortened its purchase and whereas the consumer is unaware.

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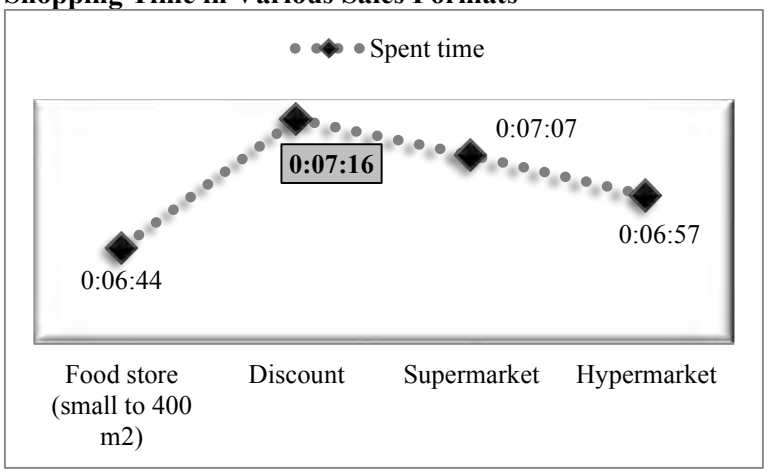
Figure 4 Average Shopping Time in Various Sales Formats



Source: own research

4. Conclusion

In 2015, a majority of Europeans wished to buy more than save. It shows a number of favorable factors. Real drop in oil prices lighted invoices households for energy to release the purchasing power and changes in inflation. Changes in consumer behavior in Europe occurred in two ways. In the field of quantity and in quality of distribution channels, or sense of priorities that consume before or after attributed. Slovaks buy more even if they often do not have enough time for shopping in a store or over the Internet. In our research we found out, that more than 60 % of respondents are influences by time in their purchase decision making. Most men buying over 0 - 10 minutes, women buy 11 - 20 minutes. Both hypotheses were confirmed. The longest average purchase was realized in discounts. On the contrary, the shortest was in small food stores to 400 m^2. In discounts and supermarkets, the customers spend more than 7 minutes. Over 6 minutes, they usually purchase in small food store or in hypermarket. Except time factor, in new trends of consumer behavior there are many factors which influence our emotions and senses directly on shopping place, as lighting, aesthetics and sale techniques, staff, aroma, musical background or color. These trends could be measured by modern survey techniques used in neuroscience too.

Acknowledgements

This paper is the result of primary and secondary research within the national project VEGA1/0874/14 *"The use of neuromarketing in visual merchandising"* and international educational project *"Erasmus+ Strategic partnerships - Food quality and consumer studies"* Nr. 2014-1-SK01-KA203-000464.

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Trends in utilization of selected technologies in grocery stores

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Abstract
Just like all the other trade sectors so is retail business prone to various changes and trends which affect not only merchants themselves, but their customers too. It is specially the retailing industry where huge changes are in progress with respect to the development of information and communication technologies. The basic trends of retail trade can be divided into two groups. First one includes those that are inspired by the past and logically in the other there are trends that are formed based on current technological solutions and future consumer behaviour estimates. In constantly intensifying competitive environment of the current retail business it is necessary both to perceive and be interested in the customer needs and desires on one hand, and on the other to follow modern technological capabilities, as well as any competitor activities. In addition to knowing the needs and desires of your customers is for business success necessary to also focus on how these customers are transforming in relation to the lifestyle changes, which was among other things initiated by smart mobile devices, internet access or access to information and not least the social networking phenomenon. This article is discussing a comprehensive review of trends in utilization of selected technologies and their reception by customers /perception in Slovak grocery stores. Research is integrating questionnaire survey and observation in real conditions in selected retail outlets. Based on the findings paper conclusion includes proposals applicable to the food market especially regarding the use of new technologies to improve customer comfort and thus their satisfaction during shopping process. The paper is the result of the primary and secondary research in the national research project VEGA 1/0874/14 Using Neuromarketing in Visual Merchandising and International Food Educational Project Erasmus+ Strategic partnership Food Quality and Consumer Studies Nr. 2014-1-SK01-KA203-000464.

Key words: *retailing, new technologies, trends, customer, retail chains*

JEL Classification: *M31, M39*

1. Introduction

Nowadays, instead of the concept of retail chain is more used the English term "retail" or "retailing", which implies an international dimension of the retail and a complex of retail operations [3]. Retailing in the new millennium stands as an exciting, complex and vital business sector in most developed as well as emerging economics. Key trends and developments such as changing customer needs and increasing interest in the shopping experience as much products, retailer consolidation, emerging multichannel retailing strategies, changing nature of competition within and between retailing formats, globalization and technological breakthrough such as radio frequency identification (RFID) and personal selling assistants (PSAs) are having or will soon have a dramatic impact on the way large retailers do business in this new century [6]. These demands, resp. customer requirements in particular methods of communication and various shopping options are very closely related to the expansion of the Internet and the development of mobile devices such as mobile phones and tablets [1]. Shopping itself is facing a major change, since customers have a choice of where to buy the proper product [9]. To be innovative and not afraid to take risks and come to the market with something new as the first one, can for a company mean a revolutionary event that moves it between the successful companies [5].

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In connection with the change in lifestyle, which was initiated by smart mobile devices, Internet access to the information and not at least by the social networking phenomenon, the customer is changing also. It is said often, that the customer is changed in the following dimensions [2, 7]:

- *Knowledgeable customers*

Customers have the same information as the sales staff and they have therefore become redundant and they do not need the sales staff.

- *Demanding customers*

Customers are aware of their value for the retailers and accordingly to that they increase their entitlement to the service, product quality and speed of purchase.

- *Independent customers*

Customers want to have a chance to do their purchase regardless of the sales staff.

- *Inspiring customers and cooperating*

Customerscan, with their initiative, influence the type of future retail or theyinitiate the changethemselves.

- *Diverse customers*

With the advent of the Internet and the development of electronic shopping and smart mobile devices, the retail customers are changing also.

- *Interactive customers*

Customers increasingly wish to try the products before the purchase,to enchant the purchase in stores,to involve all the senses in the purchasing decisions.

- *Travelling customers*

Thanks to the expansion of the opportunities for the purchase of goods and services by the mobile phones, the number of customers who use these forms is increasing even if they are thousands of kilometres far away from the nearest shop.

Several dozen trends can be found worldwide,which the retailers indicate as the reasons for their success, as well as the direction which such modern retail will take. From this great amount we canselect primarily two key trends [9]:

- *Omnichannel*

This is a new way of strategic management of a retail company that combines store, e-commerce and mobile applications, which ensures 24-hour accessibility for the customers [8].

- *Shoppingexperience*

This expression is closely related to omnichannel and presents a number of situations and ways to use the modern technology.

Retail technology means a sum of interactive business operations in the business operating units among suppliers, employees, consumers, customers and products through technical terms. The development of the technology did not cause a boom in the use of these technologies only on the side of retailers, but also of customers [4]. The customers are those, who are familiar with the advantages of each technology, and therefore they are those, who are actively seeking for them in the shops. Customers wish to be online; they want to have fun while shopping. In this regard, it becomes necessary to offer the Wi-Fi connection, which is also good for traders in relation to social networks at tagging of location. Along Wi-Fi, they try to use also other forms of smart phones such as QR codes, payments via mobile phones, so called self-scanning – hand-scanning of each item with a mobile phone [10].In addition to mobile phones, the new trends are represented also by self-service cash registers, digital displays and a variety of other technologies, whose role is to make more pleasant and simplified customer´s purchase.

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2. Data and Methods

In order to obtain the information on the perception of new trends in grocery stores operating in Slovakia, we conducted a questionnaire survey with random buyers. The sample consisted of 50 respondents, while 9 questionnaires had to be excluded on grounds of incorrect entries, which means that the sample was reduced to 41 respondents. The research was conducted in stores mostly in the Western Slovakia in different sales formats (small grocery store, supermarket, hypermarket and discount store). As it can be seen from the Table 1, the highest participation had the respondents in the age group from 18 to 24 years.

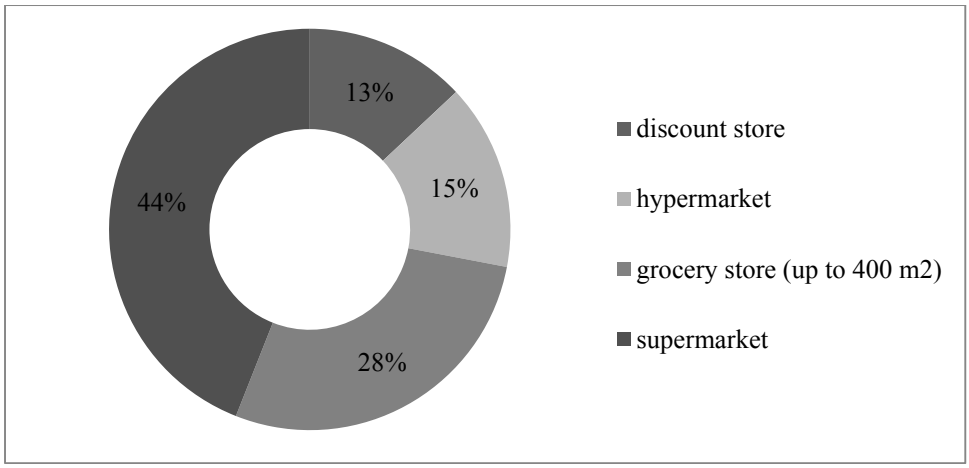
Table 1: Description of the questionnaire survey sample

Gender/Age:	18-24	25-49	50-64	65 and more
Male	10	4	2	1
Female	19	2	2	1
Together	29	6	4	2

Source: Own processing of

Subsequently, the observation, in order to determine the status of new technologies by individual sales departments, was made in 60 stores of different formats. As it can be seen from the Figure 1, the largest representation had the supermarkets, exactly 44 %. On the contrary, the smallest representation had the discount stores, only 13 %. The largest representation had the Slovak chains (*COOP Jednota, FRESH, Nitrazdroj and other retailers*), greatly were represented also the foreign chains (*Billa, Hypernova, Kaufland, Lidl, Metro, Tesco*).

Figure 1: Representation of the sales formats in the conducted observation



Source: Own processing of based on a questionnaire survey 2015

The processing of the obtained primary data was performed with the use of descriptive (frequency, quantile, average) and inductive (Chi-square test) statistics. This test verifies even if the differences of actual and expected frequencies may be only random (variables are independent) or they are too large to be only random (there is no relationship between the variables) [10].

The assumptions in this test are set out as follows:
H0: Quantities are independent.
H1: Quantities are dependent.

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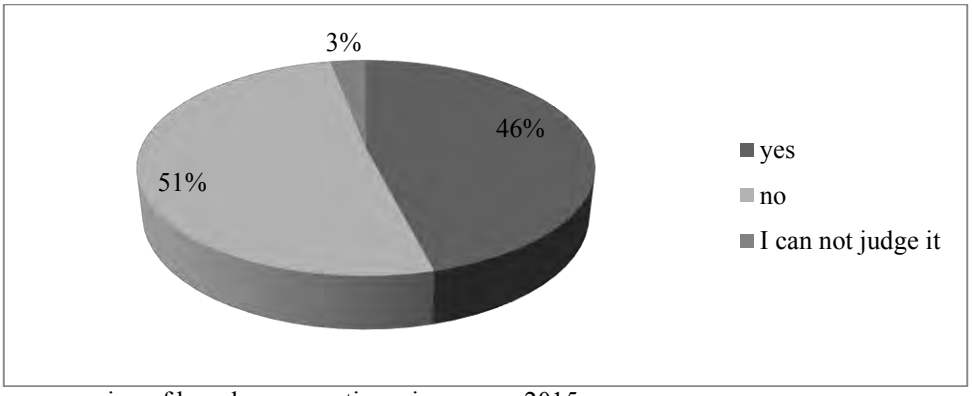
3. Results and Discussion

The entiredomestic as well as the multinational groceries are equipped with modern technologies, which amount and degree of innovation is in most cases dependent on their size. In order to map the status of technologies in chains operating in Slovakia, we conducted a questionnaire survey with the customers of individual stores. As it is shown onthe Figure 2, even 51% of respondents prefer the stores that are equipped with modern technologies. Almost the same amount of respondents, even 46% of them, said that they did not favour such groceries.

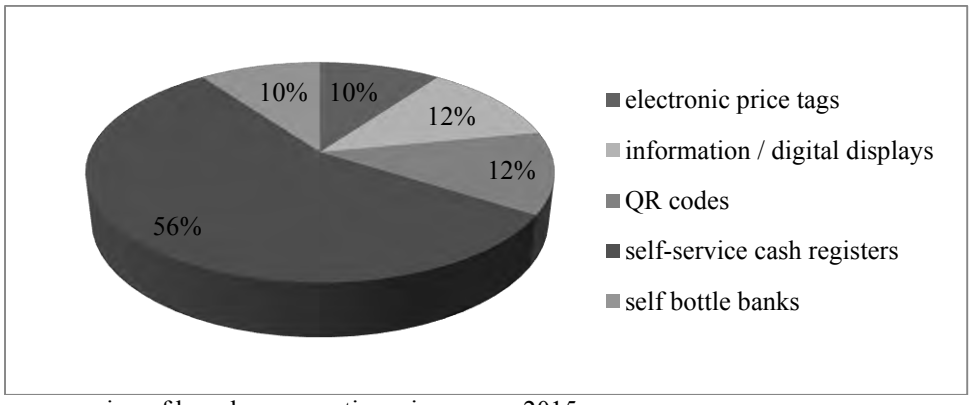
Figure 2: Favouring of stores in terms of equipment with modern technologies



Source: Own processing of based on a questionnaire survey 2015

In terms of the perception of individual modern technologies, most of customers register the self-service cash registers, even 56%. To a much smaller extent, these customers notice other technologies, such as electronic price labels (10%), QR codes (12%), information / digital displays (12%) and self bottle banks (10%) (Figure 3). In this case it should be noted that the electronic tags were for the first timein Slovakia introduced by COOP Jednota through COOP Jednota Nové Zámky and Námestovo, in two stores with the type of Tempo supermarket. Electronic tags are highly effective in comparison with the conventional paper price tags. They allowshowing any information about the price of a product, and they can be changed at any time from a central computer. Theprices of more than 12000 items of goodscan be shown at any time and they can be changed at the same time without cabling. The aim of introducing the electronic labels was to reduce the number of mistakes in the evaluation of products, improved readability for customers and reduction of the labour intensity of staff. Another advantage is the high contrast and resolution with wide-angle elevation and good readability.

Figure 3: The perception of modern technologies in grocery stores



Source: Own processing of based on a questionnaire survey 2015

In terms of the impact of each technology on the actual shopping process, it can be based on the Figure 4 stated, that the least impact on the customers have the electronic price tags (almost

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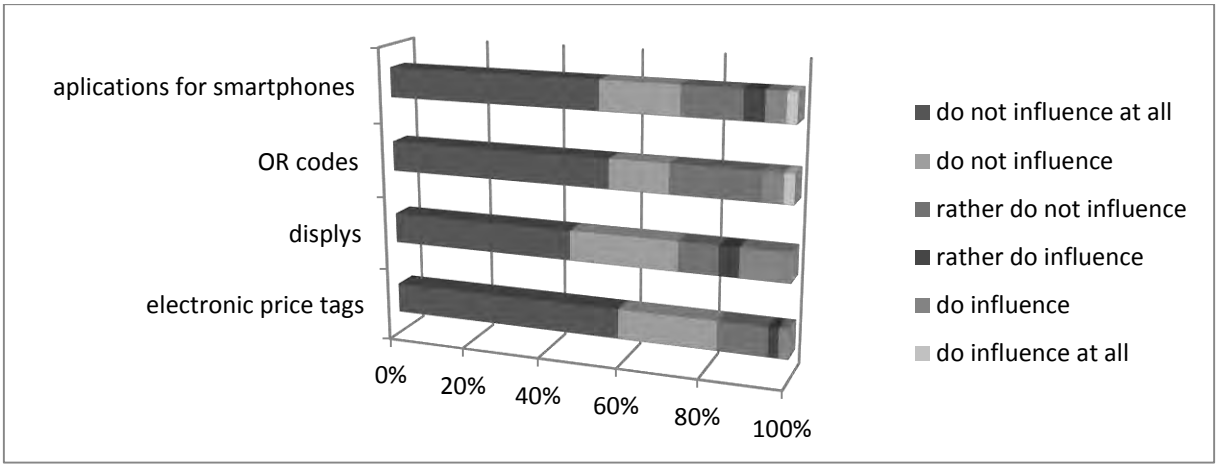
95% of respondents said that they do not affect them) and applications for smart phones (almost 90% of respondents said that they do not affect them).

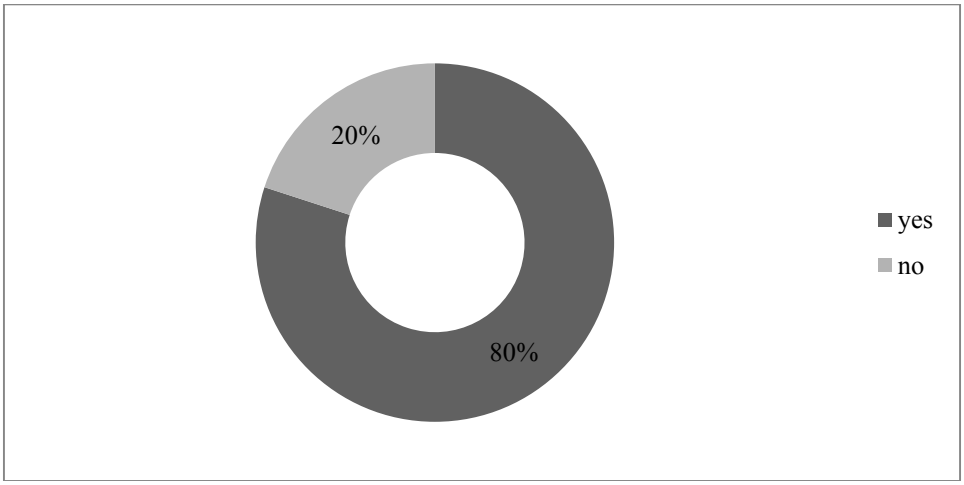
Figure 4: The impact of selected technologies on consumer decisions



Source: Own processing of based on a questionnaire survey 2015

The survey shows, that Slovak consumers, who have participated in the questionnaire survey are opened to the new modern technologies.Even 80% of them would like more new technologies in grocery stores, in order to improve the services, to make the buying process more pleasant and faster. Within the modern trends, the consumers mostly in grocery stores operating on the Slovak market lacked a free Wi-Fi connection, from which are derived numerous technological innovations.

Figure 5: Consumer relationship to new technologies



Source: Own processing of based on a questionnaire survey 2015

In addition to assessing the respondent´s opinion, we have also focused on the analysis of the assumption, where we have assumed that there is a relationship between thegender and the preference of retail, which offers new technologies. The difference in preference of retails up to the gender is shown graphically on the Figure 6. This dependence was verified with the use ofChi-square test of independence on the level of significance 0,05; while the hypothesis about the dependence of mentioned variables was confirmed.

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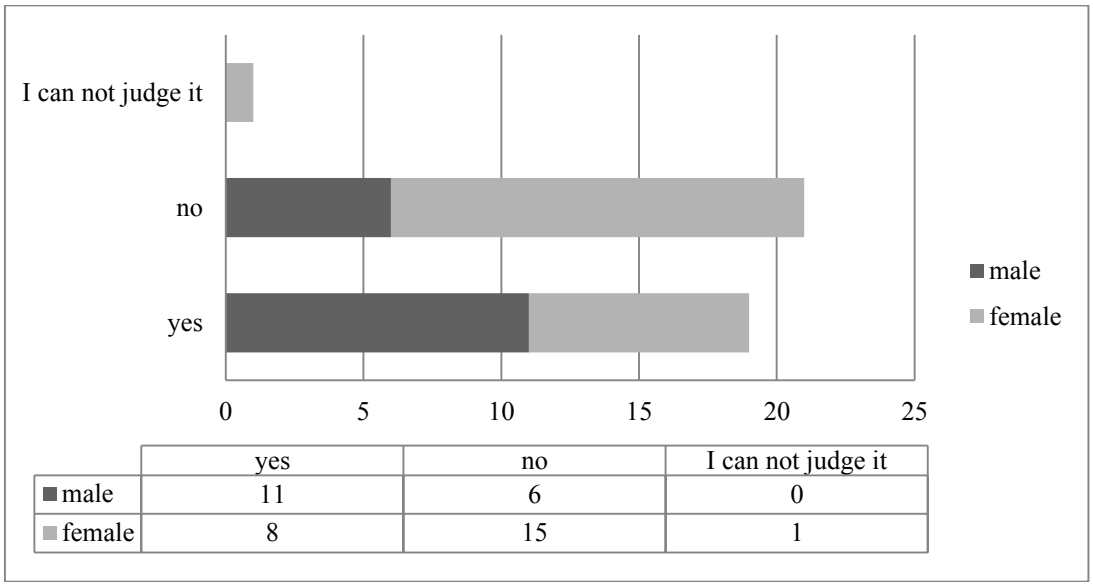
Figure 6: The relationship between the gender and the preference of retail, which offers new technologies

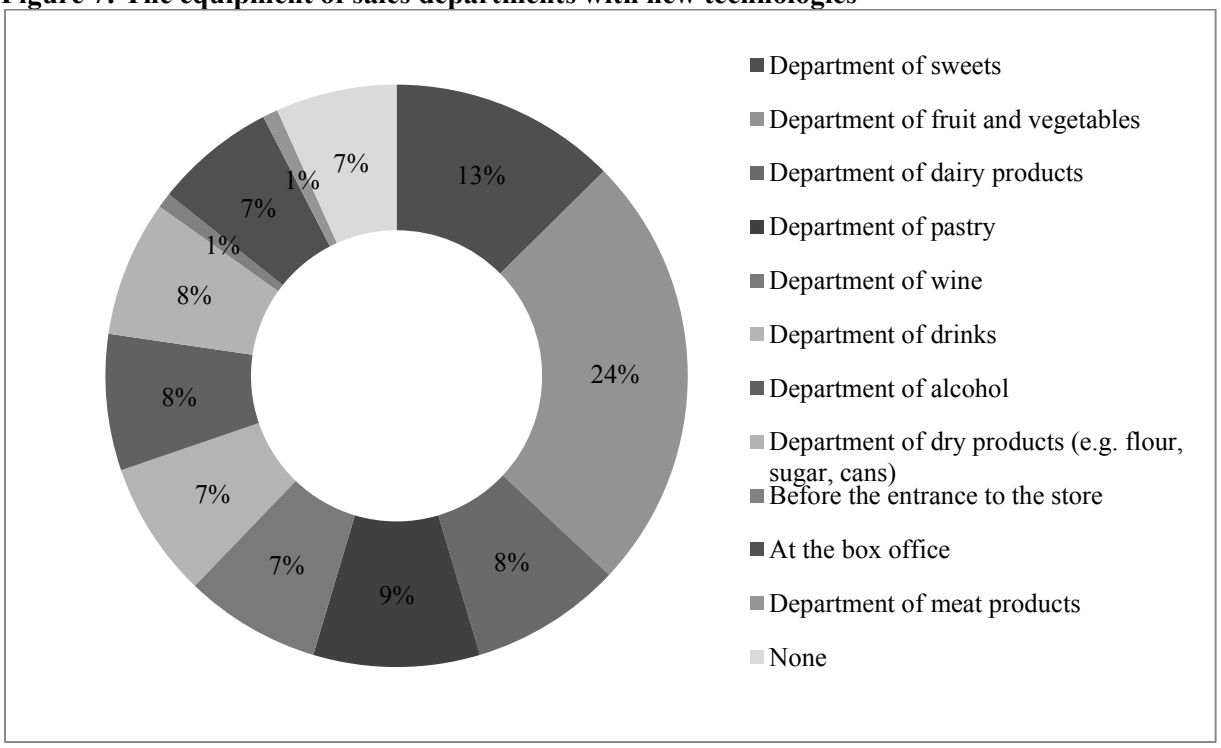


	yes	no	I can not judge it
male	11	6	0
female	8	15	1

Source: Own processing of based on a questionnaire survey 2015

Up to the results of monitoring the representation of modern technologies in various sales departments (Figure 7) it can be stated, that the most technologiesare situated in the department of fresh fruit and vegetables, up to 24%. The digital displays placed in those departments mainly in supermarkets COOP Jednota are contributing to the higher values. To the departments, in which were recorded a higher numbers of modern technologies could be includedalso the departments of sweets 13% and at the box office 9%. On the other hand, the least technologies are situated before theentrance of theshop 1% and in the department of alcohol 1%.

Figure 7: The equipment of sales departments with new technologies



Source: Own processing of based on a questionnaire survey 2015

4. Conclusion

Innovations, news and new trends are the engine of the human population, which thanks to them expands its options. The emerging trends are those that indicate the direction of the contemporary world, which leads to the facilitation andimprovement of daily life. Products of new technologies related to the informatisation of society and their impact on the development in retailing, are nowadays often discussed motives. The scope and complexity of this very dynamic issue creates a place for many discussions and researchesof most diverse aspects that so far due to the rapid development in this area and lack of time for the analyze of fall-outs, make up an unexplored area. Based on our survey, it was found out that most of those surveyed have recently noted the self-service registers (56% of respondents), QR codes (12% of respondents) and self bottle banks (12% of respondents). We also found out that from the selected technologies, the consumer is in his purchase at least affected by the electronic tags (95% of respondents are not affected by electronic tags in their purchases). The questionnaire survey showed that 80% of surveyed had no negative experience with technologies in retail. Most modern technologiesare situated in the departments of fresh fruit and vegetables and also in the department of sweets. We found out that technologies in retail are very important, since they provide the consumers with more convenient shopping. Especially important is the unity of all these channels not only visual, but exactly the unity of this interaction and customer delight.

Acknowledgements

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The influence of product placement in Czech movies and TV shows among generation Y

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Abstract
This paper is focused on how product placement is perceived by generation Y. The data were collected through eye tracking using the SMI RED 250 device. In-depth interviews were used to acquire a more detailed understanding of the opinion of the respondents. The research was conducted during December 2014 and January 2015 in the Eye Tracking Laboratory at Mendel University. 35 respondents representing generation Y were involved in this research. The main objective was to determine their attention to product placement, brand recall and their attitudes to product placement. Several parts of movies and TV shows were shown to the participants and their attention was measured through the eye tracker. Although the viewers looked at the products, they often were not able to recall them afterwards. The brand recall was higher when they were familiar with the brand. The results show that the audience is more strongly affected by prominent product placement than by subtle placement. The audience is able to remember an audio-visual product placement better than an audio or visual placement. Men are more sensitive to product placement related to male product categories (cars, alcohol and sexual health products). Women on the other hand are more sensitive to product placement related to fashion products.

Key words: *product placement, consumer behaviour, consumer perception, brand recall, eye tracking, generation Y*

JEL Classification: *M31*

1. Introduction

These days it is very difficult to attract a consumer, as media are often overloaded by advertising messages. Companies therefore begin to use another possibilities of promotion. One of them is product placement, which became popular in the recent years. It was legalized in the Czech Republic on 1st June 2010 (Kalista, 2011). Since then, audience has been daily meeting it in Czech movies and series with main characters using products of specific brands, driving specific cars, wearing branded clothes or using services of specific companies. Unfortunately, makers of Czech movies and series do not have enough experience and thus product placement often reminds of teleshopping. This article is focused on perception of product placement by generation Y, which is represented by young consumers. It was examined within the research how it influences representatives of generation Y. The eye tracking device scanning eye movements was used for the research. Data obtained from this research were completed by in-depth interviews in order to gain more detailed information about opinions and attitudes of respondents.

1.1 Product placement

Definition of product placement has gone through a series of changes during the years, naturally the nature was preserved. One of the first definitions created by Balasubramanian (1991), who defines product placement as planned entries of products on television programs, which may influence conviction of audience or positively influence their behaviour (Hudson, Hudson, 2006). Gupta and Gould (1997) add that a brand tends to be included in production in exchange

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for money or another equivalent (Chan, 2012). Product placement can be distinguished from various perspectives. Smith (1985) realized simple division of product placement according to the form of communication into visual, audio and combined audio-visual product placement (Chan, 2012). In visual product placement, a product, a logo or another identifier of a brand is placed in a shot so that a watcher may notice it, however without any accompanying message or sound. In audio placement a product or a brand is mentioned by an actor, a reporter or someone from involved people. A watcher does not see a product or a brand in a shot. Audio-visual product placement is combination of both techniques, displaying of a product is accompanied also by conversation, in which a given product is mentioned (Chan, 2012; Jurášková, Horňák, 2012). Former studies (Karrh et al., 2003; Rusell, 2002; Gupta and Lord, 1998, Sabherwal et al., 1994 in Karrh et al., 2003) prove that modality has influence on ability of audience to remember a product. A watcher best recalls audio-visual placement, then audio placement and lastly visual placement, which is in accordance with psychological research showing that more complicated processing of information simplifies their later recall. Combination of audio and visual information is thus the most difficult for processing but also the most meaningful and a watcher saves it deeper in memory (Rusell, 2002).

Another authors (Ferraro, Avery, 2000; Gupta, Lord, 1998 in Chan, 2012) distinguish prominent and subtle product placement. In case of prominent placement, a product or a brand is located in front of a camera in a direct shot. A product is well seen on a screen, it is in a screen centre, it is usually displayed for longer time, mentioned more times in a dialogue or used by a main character. On the other hand, subtle placement is incorporated inconspicuously into a screen, what can make a more natural character of a program, which may bring stronger impact and strength of conviction, if a product is identified by audience. Audience takes more positive attitude to subtle placed products, but on the other hand there is a risk that a watcher will not notice a product at all (Lehu, 2005; Ferraro, Avery, 2000, Chan, 2012). Results of several studies (d´Astous and Chartier, 2000; Law and Braun, 2000, Lehu and Bressoud, 2008; Dens et al., 2012) imply that a brand will more likely get into awareness of audience by prominent placement than by subtle placement. At the same time, research of Dens et al. (2012) claims that subtle placement leads to more positive attitude than prominent placement because of the fact that prominent placement is perceived as less realistic, disturbing and distracting.

Connection to a plot has also influence on remembering of product placement. Research (Rusell, 2002; Dens et al., 2012, Brennan et al. 1999 in Dens et al., 2012) led to conclusion that it is more probable that audience will remember a product if its placement is meaningful and connected to a plot.

In conclusion, it is necessary to mention research, which dealt with differences in perception of men and women. Studies claim that differences in perception of products occur especially in case of ethically questionable products. According to results of this research men perceive and accept alcohol, weapons and sometimes also cigarettes more, women prefer “healthy products” (Gupta, Gould, 1997; Kramoliš, Kopečková, 2013).

2. Data and methodology

Results of the research were achieved by the realized eye-tracking observation. The research was realized in two stages. The first round took place from 1st December 2014 until 5th December 2014. Only men were invited to the second round of the research, which took place on 22nd January 2015 and 26th January 2015, because in the first round there participated significantly more women than men. Totally 21 women and 14 men in the age of 20 – 30 years participated in the research. The vast majority of respondents was from students. 25 of them participated in the research, nine participants were from employees and one female participant

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was on maternity leave. One observation took approximately 1 hour and 10 minutes. Participants were neither informed about content nor about the form of observation in advance in order to avoid distortion of results. The sample size corresponds with the international standard of eye-tracking research.

The research was carried out through eye-tracking and in-depth interviews. Eight previews of Czech movies and series where product placement occurred were projected to participants. Through eye-tracking it was observed if respondents noticed given products or brands and for how long they concentrated their attention to them. Subsequently attitudes of participants related to product placement were investigated through in-depth interviews to find out whether watchers remembered given products, how their placement impacted them and whether it somehow influenced their buying behaviour.

Videos were edited by the program Freemake Video Converter and then converted into the AVI format, which is supported by the eye-tracking software. The subsequent research was realized directly in the eye-tracking laboratory at Faculty of Business and Economics at Mendel University, which uses the eye-tracker SMI RED 250. In order to create the experiment the software SME Experiment Center was used. Another program used during the research was the SMI IView X software serving as controller of the eye-tracker. Obtained data were analysed by the program BeGaze. Individual images of video were traced and delimited by so-called AOI (area of interest). Values serving to evaluation of attention were Subject Hit Count = number of watchers who watched AOI (area of interest) and Dwell Time Average = average time spend in AOI. Individual AOI were areas of images, where a picture of a product or a brand appeared.

Picture 1: Example of AOI

Source: output of the software SMI BeGaze

2.1 Tested previews

Tested previews contained various types of product placement. Audio product placement was evaluated only based on in-depth interviews. In visual and audio-visual product placement eye-

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tracking as well as in-depth interviews were used. Size and time of visualisation of individual products is stated in the Table 1.

Previews from the following movies or series were used: Probudím se včera, Rafťáci, Dědictví 2, Ordinace v růžové zahradě 2, Vinaři, Sněženky a machři po 25 letech, Účastníci zájezdu.

Table 1: Parameters of placed products

Area of Interest	AOI Size (px)	AOI Coverage (%)	Visible Time Maximum (ms)	Visible Time Maximum (%)
Kamikaze	72 039	12.2	5 960.0	16.7
Evropa 2	19 718	3.3	22 802.9	64.0
Tuzemák	39 688	6.7	6 921.0	19.4
Tictac	113 225	19.2	960.0	2.7
Orbit	56 576	9.6	3 961.0	18.6
Big Shock	28 951	4.9	2 400.0	11.3
Bohemia Sekt	65 983	8.4	36 722.0	44.8
Volkswagen	11 212	1.9	12 640.9	24.3
Bandi	64 053	3.1	39 803.0	64.6
Roxy	15 878	2.7	18 641.0	22.1
Rossignol	42 229	7.2	27 640.8	32.1
Transbeton	8 954	3,1	10 360.9	18.4

Source: output of the software SMI BeGaze, own processing

2.2 Tested assumptions

Within the research there were investigated assumptions based on the previous studies. As the first one, the relationship between noticing a brand and its remembering was researched. The objective of examining this assumption was to find out if a watcher remembers a brand when he/she notices it in a video. This assumption was examined for visual and audio-visual product placement.

Another examined assumption was the relationship between brand awareness and remembering it. The task was to verify if watchers better recall brands that they have already known from the past.

Furthermore, the relationship between product placement and remembering of a brand was examined. The objective was to verify if audio-visual product placement achieves the best score in remembering and, on contrary, if visual product placement achieves the worst remembering. Audio-visual product placement included brands Bandi and Bohemia Sekt. Remaining brands (Kamikaze, Evropa 2, Tuzemák, Tic Tac, Orbit, Big Shock, Volkswage, Roxy, Rossignol and Transbeton) fell into visual product placement.

Another examined assumption was the relationship between plot connection of a brand and its remembering. The objective was to test if watchers better remember brands connected with a plot than those that are not connected. Brands connected with a plot included: Tuzemák,

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Bohemia Sekt, Volkswagen, Bandi, Roxy and Rossignol. Brands considered as not connected to a plot included: Kamikaze, Evropa 2, Tic Tac, Frekvence 1, Orbit, Big Shock, Transbeton and Arginmax.

Further the relationship between highlighting a product (prominent or subtle placement) and its remembering. The task was to find out if watchers better remember prominent placement than subtle placement. Prominent brands included: Tuzemák, Orbit, Bohemia Sekt, Volkswagen, Bandi, Rossignol a Transbeton. Subtle placed brands involved: Kamikaze, Evropa 2, Tic Tac, Frekvence 1, Big Shock, Roxy and Arginmax.

The last examined assumption was the relationship between highlighting a brand (prominent and subtle placement) and attitude of audience to placement of this brand. Within this assumption it was examined, if prominent placement elicits more negative attitude of audience than subtle placement.

3. Results and discussion

Analysis of data obtained from examination offered interesting information about perception and attention to individual types of product placements used in Czech movies and series.

In the first preview of the movie "Probudím se včera" attention of participants was focused especially on the main character and further significant elements in the scene. Only the brand Orbit obtained full attention among placed brands. This attention was probably caused by direct interaction of the actor with the product. Only 13 participants recalled the name of the radio station Frekvence 1 during in-depth interviews. 10 of them considered this placement as pleasant, illustrating the plot and feeling realistically. Remaining 3 respondents were bothered by the radio, it was too loud and exaggeratedly imposed on audience. These results were surprising considering that more than the half of respondents did not even notice the radio in the preview. In this case men perceived the product placement more significantly then women. While 8 of responding men (of 14) noticed it, in case of women it was only 5 (of 21). Similarly, negative attitude to this placement was taken rather by men, totally 3 responding men, who recalled the radio, did not like the placement, while in case of women it was only 1 of them. As it was stated above, only chewing gums Orbit were able to gain attention of all watchers in the first preview. Participants paid on average 73.9% (2928.4 ms) of direct attention to the product. In the subsequent interview 22 respondents were able to recall it and remaining 9 respondents realized that there was some kind of dispenser placed on a fridge, but they were not able to identify what brand it was, what was probably caused by the fact that any of the watchers had not met with the given dispenser for Orbit chewing gums before. The last four respondents did not recall the product at all. In total, 25 of respondents did not have any problem with placement of this product, it did not bother them in spite of it was too explicit for some of them. Remaining 10 respondents had negative attitude to the placement, according to them the placement was exaggerated, disturbing, illogical and imposing the product too much. The dispenser in the preview attracted watchers so much that if the product was in the common offer, 15 of them would be interested in it. Women recalled the brand a bit better than men, 14 of 21 women and 8 of 14 men remembered it. Women were also more critical to this placement, 7 of them were bothered by this placement, in case of men it bothered only 3 of respondents. Based on the previews, 10 women and 5 men would be interested in the product. The product Big Shock appeared closely in the preview only for 2400 ms and moreover in the corner of the screen, thus only 4 watchers, specifically two men and two women, were able to notice it and subsequently recall it. These participants paid only 1.9% (46 ms) of direct attention to this area. The obtained data imply that a majority of watchers paid their attention rather to acting of the main character. Two respondents who noticed the placement did not consider it as suitable, the other two were

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not anyhow disrupted by it. None of the respondents would be influenced by this product placement in case of purchasing energy drink.

The brand Volkswagen was noticed by all respondents in the second preview of the movie "Probudím se včera". Watchers paid on average 12% (1519.5 ms) of direct attention to the brand. During the in-depth interview 31 respondents recalled the brand. Remaining 4 respondents did not recall the brand what was probably caused by the fact that they, as only ones, did not know or prefer the brand. 27 respondents did not mind the placement especially because, according to them, it fit to the plot. Remaining 8 respondents were bothered by too long shoots, which had too manipulative impact according to them. In total, 10 respondents would think about buying this car based on the preview or at least they would want to find another information about it. In this case men paid higher attention to this product then women. Men paid on average 1689.5 ms of their attention to the product while women spend on average 1406.4 ms in the given area of interest. Men also paid higher attention to another cars that appeared in the preview. In the subsequent interview all men and 17 women recalled the brand. The both genders reacted similarly to the placement of this brand. 11 men and 16 women did not mind the placement. The product placement had slightly larger impact on men in relation to buying behaviour. Totally 5 men and 5 women (after watching the preview) would consider purchasing the given car.

In the preview of the move "Rafťáci" audience again focused their attention especially to the main characters. Totally 18 people look at the writing Kamikaze during the preview. On average, watchers paid 6.6% of direct attention (391.9 ms) to this area considering maximum time of visibility of the writing. 5 of 35 respondents recalled the brand during the subsequent in-depth interview. In total, 24 respondents had never met with the energetic drink. 17 of 18 respondents who noticed the product according to the eye-tracker did not mind the placement, some of them did not recall the writing at all or they considered it as a mere coulisse fitting into the given environment. This product placement would not influence buying behaviour of any respondent. Both men and women focused their attention rather on a face of a barman than the writing of a fridge. In total 8 men and 10 women noticed the brand according to the eye-tracker. Men watched the brand on average 495.9 ms while women 322.6 ms. No difference was recorded in ability to recall the product. 2 men and 3 women recalled the product. Regarding attitude to the product placement neutral attitude prevailed in case of the both genders. At the same time, this product placement did not have influence on buying behaviour of any of the genders. An eye-catcher with the writing Evropa 2 was in total noticed by 16 participant of the research. These subjects paid 1.32% of direct attention (300.10 ms) to the writing considering the total duration of visibility of the writing. All participants had known the radio Evropa 2 before watching the preview. 14 participants were able to recall that the radio appeared in the preview, 12 of which noticed the writing according to the eye-tracker. In case of remaining two participants the device did not prove attention paid to the examined area but in spite of that these people recalled the brand. It was probably caused by the peripheral vision. Any of the participants who noticed the brand (also by the peripheral vision) did not mind this placement. This placement also would not influence behaviour of watchers who had already listened to this radio and another who prefer different radio. Reactions of men and women were very similar. The writing Evropa 2 was noticed by 10 women and 6 men. Men paid higher attention to the writing, they spend on average 315.1 ms in this area of interest while women watched the writing on average for 290.1 ms. In total, 8 women and 6 men recalled the brand during the in-depth interview. Although it was assumed that all men who noticed the brand will remember it, the reality was somewhat different. As it was mentioned above, 2 men recalled the brand without the eye-tracker recording attention paid to the researched area. The placement of this brand bothered neither men nor women and at the same time it did not influence them

anyhow. Tuzemák gained the highest attention of all brands placed in this preview. In total, 33 participants paid attention to it in the preview. On average, subjects paid 13.3% (921.8 ms) of attention to Tuzemák. 18 respondents had known the brand before watching the preview. During the in-depth interview 12 people were able to recall it. All these subjects had known the placed brand. Further 7 respondents recalled that rum appeared in the preview but they were not able to tell what brand it was. Only two of these seven participants had known the brand. In total 31 of all tested people who noticed the product did not mind the placement. Seven respondents would think about buying this product after watching the preview. Remaining 28 respondents would not buy the product while the placement impacted two of them even so negatively that it would repel them from buying the rum. Through observing differences between men and women we found out that the alcoholic drink in the preview was noticed more by men than women. All 14 tested men and 19 women looked at the product during the preview. Men also focused their attention to this area for longer time. On average, their attention lasted 1033.8 ms while women´s attention lasted 847.1 ms. Considering ability to remember, there was not recorded any significant difference between men and women. 5 men and 7 women recalled the brand. Attitude to the placement is also comparable for the both genders. A majority of respondents did not mind the placement, it did not bother them. Totally 3 men and 4 women would think about buying the product based on the preview. 2 women would be repelled from buying by this placement. In spite of Tic Tac covered a large part of the screen, it was displayed for so short time that only slight percentage of respondents noticed it. Tic Tac was noticed only by 3 respondents, especially two women and one men. They paid on average 3.3% (31.8 ms) of direct attention to the product. Only one woman in the subsequent interview recalled Tic Tac. Both women stated that the placement was illogical and inappropriate, the man was not aware that he had noticed the product on a bar. All 3 participants buy Tic Tac and therefore the preview would not influence them anyhow.

The brand Bohemia Sekt in the preview "Dědictví 2" was noticed by all participants of the research. Subjects paid on average 15.2% (5578.2 ms) of direct attention to this area, considering the total time of displaying the product. 28 respondents subsequently recalled the brand Bohemia. 7 respondents were not able to identify the brand in the preview what could have been caused by the fact that none of the respondents had not met with the brand before. 19 of 28 respondents who correctly identified and remembered the brand realized that it is the brand Bohemia only in the second part of the preview when the brand logo was well-read on a box that appeared in several shoots. 9 remaining respondents associated the product with the brand already in the first part of the preview based on the typical shape of the bottle and gold colour used. All participants of the research knew the brand Bohemia Sekt however, only 9 respondents knew that this company has also non-alcoholic sect in their offer. The placement did not arise negative emotion in 14 respondents. Remaining 11 respondents criticized the placement, according to them it was too noticeable, exaggerated and annoying. In total 26 participants of the research would decide to buy non-alcoholic sect at appropriate time based on the preview. 100% of participants, both men and women, paid attention to the product. Men dedicated more time to this area of interest, specifically 6275.2 ms, while women 5113.6 ms. Men were also better in recognizing and remembering the brand. In total 12 men and 16 women recalled the brand. Men were more sensitive about the placement of the product in this case. In total, 8 men stated that placement was exaggerated, disturbing and too obvious, in case of women, it was only 3 respondents. Considering influence of the product placement on behaviour of customers, the both genders perceived it similarly. Totally 16 women and 10 men stated that they would buy the product at appropriate occasion based on the preview.

In the fifth preview from the series "Ordinace v růžové zahradě 2" views of watchers were again focused on main characters but also the placed brand Bandi gained attention of all

participants of the research. Subjects paid on average 5.8% (2289.3 ms) of direct attention to this area of interest. Subsequently, 28 people were able to recall the brand, while 15 of them had known the brand. Remaining 7 respondents neither recalled the brand nor knew it. This placement arose negative emotion in 28 participants. They stated it as unpleasant, disturbing and repelling. Remaining respondents were not bothered or disturbed by the placement. Based on this placement the brand attracted 19 respondents so much that they would at least look at internet pages or went to a shop. Further 8 respondents would be repelled from purchase by the excessive promotion of the brand. Remaining respondents were influenced neither in positive nor in negative way. During separated observing of men and women it was found out that there exists only slight difference in attention of men and women. Women watched the brand on average for 2298.4 ms and men 2289.3 ms. Women recalled the brand a little bit better. Totally 17 women recalled the brand while in case of men it was only 11 respondents. The both genders perceived this placement rather negatively, while women to a greater extent than men. The placement was unpleasant for 18 women and 10 men. This placement would have positive influence on buying behaviour for 7 men and 12 women. On contrary, it would repel 6 women and 2 men from purchase.

The concrete mixer with the writing Transbeton in the preview from the series "Vinaři" gained attention of 31 participants of the research who paid it on average 11.8% (1217.9 ms) of their attention. Only 5 respondents recalled the brand for producing concrete. Another 24 were not able to recall the brand name but they realized that there was the concrete mixer in the preview where the name was stated. Last 6 respondents did not recall at all that there would appear any brand in the preview. Only one participant of the research had known this company but he was not able to recall it. The placement negatively influenced 11 respondents, others did not mind it at all. Only 5 respondents would, based on the preview, search if the company is located in their surroundings and they would look at its offer. Remaining respondents would not be anyhow influenced by the preview, they would choose the company especially based on a location and references. During separated observing of attention of men and women it was found out that men paid more attention to the area, on average 1538.3 ms. Women watched the area only for 1004.2 ms. 4 men and 1 woman were subsequently able to recall the brand. The placement was considered as appropriate and fitting into the plot by 9 men and 15 women. The placement influenced men more. 3 of them would look at the offer of the given company, in case of women it would be only one of them.

In the last but one preview from the movie "Sněženky a machři po 25 letech" watchers paid the most attention to faces of actors but also the brand Roxy gained relatively high attention. According to the eye-tracker, this brand was noticed by 28 participants of the research who watched in on average for 1018.4 ms (5.5% from the total time of displaying). During the in-depth interview, 21 respondents were able to recall the brand. One person who recalled the brand, had not noticed it according to the eye-tracker, which can be caused by the peripheral vision. In total 11 respondents had not known the brand before watching the preview, nevertheless, 4 of them were able to recall the brand. Only 1 respondent was bothered by the placement. During purchase, 12 respondents would be influenced by this placement especially, they would look at the offer of this company. During separated observation of men and women it was evident that women paid higher attention than men. While 17 women watched the brand on average for 1086.2 ms, 11 men watched it for 916.7 ms. 14 women and 7 men were subsequently able to recall the brand. These numbers are probably the results of the fact that it is the female brand, which had been known by 14 responding women and only by 3 responding men. The placement of this product did not bother all men and 20 women. In examining influence of the placement on buying behaviour it was found that men would think about purchase based on this placement more than women. Skis of the brand Rossignol appeared in

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the preview several times. They gained the highest attention in the scene where they created a significant part of the screen. In this scene, 34 participants of the research noticed the brand. Thanks to further scenes also the last participant of the research noticed the brand. Total attention that respondents paid was around 15.7% (4332.6 ms). 26 respondents subsequently recalled the brand. In total 6 respondents had not known the brand, only one of them was able to recall it in spite of this fact. The product placement did not arise negative emotions in a majority of respondents. In total 6 respondents were bothered by the placement. Based on the preview, 16 respondents would include the brand into selection in case of buying skis. Men watched the brand on average for 4449.1 ms and women for 4255 ms. 17 women and 9 men subsequently recalled the brand. Women were more critical to the product placement, in total 4 women and 2 men were bothered by the placement. However at the same time, women would be influenced by it more than men during shopping. In case of women 11 respondents would consider purchase of these skis, in case of men it was 5 respondents.

21 respondents recalled the brand Arginmax after watching the last preview from the movie "Účastníci zájezdu". In total 26 participants of the research had known the brand Arginmax. The placement did not arise negative emotions in a majority of respondents (32). Only 3 respondents considered the placement as inappropriate. Regarding the fact that participants are not the target group of this product it is difficult to evaluate a level of influence of the product placement on buying behaviour. 23 respondents stated that if they thought about purchasing of such a product they would probably choose the given brand. Remaining 12 respondents would not be influenced by this placement even if they would be considering purchase. During separated observation of behaviour of men and women it was found out that women remembered the product better. While 10 responding women recalled the product, in case of men it was 11 respondents. It could have been caused by the fact that the brand awareness was by 31% lower among women. No man was bothered by the placement, 3 women considered it as inappropriate. In total 13 women and 10 men would think about buying the product in case of need.

4. Conclusion and discussion

The submitted results proved that product placement gains attention of audience. The research had some limitations that were caused by the way of realization. Participants could realize during the previews what is the test focused on. Another method would not be suitable considering effectiveness.

It was found out, just like by the research of the company Key Lime Interactive (2011 in Gehrke, Knodler, 2011) that audience pay the most attention to faces and especially when characters talk.

Results of the research are in correspondence with the theory (e.g. Hanna, Wozniak, 2013) that a mere exposition does not influence perception. In spite of watchers looked at displayed products during the research, they were often unable to recall them. Therefore it is necessary to gain their attention that leads to further processing of individual impulses. Hence, it is necessary that a product is sufficiently interesting or specific in order to gain attention for itself, or alternatively it has to be placed so significantly that it influences watchers.

Watchers better remember brands they know than those they do not know. Thus, product placement is not an entirely appropriate tool of promotion of unknown products or brands. On contrary it appears to be suitable for new products of known brands, alternatively for existing known products of known brands.

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There is influence of several factors on ability to remember placed brands or products. One of them is also a type of product placement. The research implies that audience best remember audio-visually, then audio and finally visually placed products. These findings correspond with previous studies (Sabherwal, Pokrywczynski, Griffin, 1994; Gupta and Lord, 1998; Rusell, 2002; Karh, McKee and Pardun, 2003). In this research watchers better recalled visually placed products in cases when they were incorporated into a plot than in cases when they created a mere coulisse. This corresponds with claim of Rusell (2002) and Dens et al. (2012) that watchers better remember product placement if it is connected to a plot.

Another factor influencing ability to remember is a method of highlighting a product. Results of the research imply that prominent product placement leads to higher score of remembering than subtle placement, what again corresponds with earlier conducted studies (Law and Braun, 2000; d´Astous and Charteer, 2000; Lehu and Bressoud, 2008, Dens et al., 2012).

Naturally, a way of highlighting has influence also on attitude of audience against product placement in given shows. Results of the research are in accordance with foreign studies (Atkinson, 2003; Cowley a Barron, 2008; Homer, 2009; Dens et al. 2012), which show that watchers are more bothered by prominent product placement than subtle placement. According to opinions of respondents, this placement is too disruptive, distractive and unpleasant while subtle placement does not bother at all during watching a show. Incorporation of product placement into a plot has also influence on attitude of audience. In placement connected to a plot, audience did not mind this placement so much even in case of prominent product placement. On the other hand, placement not connected to a plot was marked as exaggerated, disrupting or too obvious. In many cases, placement can have so strong influence that it will repel watchers from purchase.

Regarding difference between perception of men and women, men are more sensitive to products falling into “men category”. They perceived cars, alcohol, heavy mechanics and the pharmaceutical product for erectile dysfunction more than women. In addition to this, in case of cars, men more noticed not only the main presented car but also cars in background. On the other hand, women more perceived products connected with fashion (clothes and accessories). Another studies dealing with this issue (Gupta and Gould, 1997, Kramoliš and Kopečková, 2013) claim that men more perceive and accept alcohol, weapons and cigarettes (thus ethically questionable products), on contrary, women accept “healthy” products. Thus, the fact that men perceive alcohol more corresponds with findings of these researchers. However, considering acceptance of alcohol placement only two women did not like alcohol in the scene, what does not considerably confirm findings that women accept this type of product worse than men.

Probably the most important difference in acceptance was recorded for the product for erectile dysfunction and non-alcoholic sect. While none of men was bothered by the placement of the product for erectile dysfunction, 20% of women marked it as inappropriate. Since products connected to sex can be also considered as “ethically questionable” it is possible to notice correspondence of findings with another studies. The placement of non-alcoholic sect was accepted more by women than men. If non-alcoholic sect was considered as “a healthy product” (given its non-alcoholic character), this product would be also in accordance with the previous studies. However, it is necessary to add that a high level of not accepting this placement from the men side does not have to be a clear consequence of the product itself but only inappropriately realized placement.

Furthermore, results imply that in case of cars, men are more suggestible then women (after watching they would think about buying a placed car), what naturally can be caused by the fact that women let men to buy a car. Within this research, women would let themselves to be

influenced to buy the atypical dispenser for chewing gums. In other products there was not recorded any greater difference between men and women.

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Qualitative evaluation of chosen online and offline communication means towards visitors of a selected city

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Abstract
Currently not only companies, but also cities, destinations or regions face the challenge of use of new technology in communication with their customers. This paper examines few chosen online and offline communication means (brochures, webpage) of a selected city (Plzen, Czech Republic) with help of simple qualitative research approaches, including research with help of an eye tracker. Authors also compared the webpage of the city with two other cities within Czech Republic. The means of communications were analysed with following focus: technical processing, content and design (marketing value). The authors revealed some positives, but also some imperfections, e.g. in newsletter, content filters in the communication of the city.

Keywords: *city, communication, eye tracking, evaluation, tourism, visitor*

JEL Classification: *H11, L83, L86, M31, Z33*

1. Introduction

Currently tourism destinations are facing the challenge of use of new technology in communication with their customers (visitors, tourists). Recent technological development brought many new possibilities for promotion activities of companies and other subjects. Especially the development of web pages from Web 1.0 to recent Web 3.0 (Minazzi, 2014), social media, portable devices applications and for example HbbTV (hybrid broadcast broadband TV - combination of classical TV and digital content) challenge marketers in most organisations. Together with traditional instruments of communication mix this variety of promotion opportunities, change in customer behaviour in tourism (Cohen, Prayag, Moital, 2014) marketing managers of destinations have to choose appropriate set of integrated communication instruments. Nowadays, the websites still remain the most important interfaces in HCI (Human-Computer Interaction). (Wang et al., 2014) On the web tourism destinations faces dynamic and innovative development. Multichannel (integrated) communication solutions are needed to attract visitors´ (users´) attention. Integration of social media, several platforms (blogs, web) and advertising possibilities is crucial. (Fensel et al., 2016).

In general, all promotional material mix text and graphic (images) information. New technology allows combining text also with video and animated content. The purpose of all marketing material, including the web pages is to protect users (readers) from moving away to another material. The reason could be technical, content, form or design based. (Djamasbi et al., 2010)

Although internet is nowadays one of the most important channels for the promotion and sale of tourism services (Huertas-Garcia et al., 2014; Pompurova, 2014), the use of traditional instruments still remains necessary, e.g. for less technological savvy customers. This has lead the authors to the comparison of online (new) and offline (traditional) communication means of a selected city destination.

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Thus, the objective of this article is a qualitative, case study-like, comparison of brochures (traditional) and webpage ("new") of the city of Pilsen (Czech Republic). The focus will be set on technical processing, content and design.

2. Data and Methods

The paper uses qualitative approach to evaluation of selected communication means of the city of Pilsen (Czech Republic). It can be understood as a case study from a city. This limits the possibilities for statistical evaluation of findings.

The authors chose to examine both offline and online communication. They selected a brochure "City of Pilsen", which is the general brochure aimed at visitors (tourists) which publishes the city for several years (the authors have researched brochures from the period 2004-2015 – see Figure 1) as example for offline communication. The city publishes several other brochures for tourists, one of them are "tourism attractions", another "City of Pilsen with children" etc.

And the website targeted on tourists (visitors) has been selected for online communications (plzen.eu/turista, www.visitplzen.eu – both referred at the time of the analysis – 12/2014-01/2015 – to the same content).

Figure 1: Front pages of the brochure "City of Pilsen" 2004-2015

2004 2007 2008 2009 2010 2011

2013 2014 2015

Source: own archive

The main research focus for both online and offline communication means has been placed on three areas:

- technical processing,
- information (content analysis),
- marketing value (incl. user experience, design).

Qualitative evaluation of selected communication means had been conducted. The authors realised 21 non-structured interviews for evaluation of the brochure – age structure – see Table 1. The age of respondents variated between 24 and 79. 13 were women and 8 men. None of the respondents has been living in the city of Plzen (district Plzen-mesto). The interviews took part in October 2015. The interviewees had all 9 printed versions of the brochure available to analyse

and go through during the interview (each respondent had 2 minutes to examine the brochures). The interviews started with initial question, which asked for impressions about the brochures.

Table 1: Structure of respondents - brochure

Age	Number of respondents
24-35	7
36-45	4
46-55	5
> 56	5
Total	**21**

Source: own research, 2015

For analysis of the webpage 10 semi-structured interviews with eye tracking scenario study were used. Further own observations (user experience) of authors were used, especially for evaluating the newsletter.

The eye tracking part of the research used the cognitive walkthrough for the web (CWW) approach (Habuchi, Kitajima, Takeuchi, 2008; Habuchi, Takeuchi, 2012) which is sometimes references as scan-path method (Coco, 2009). The scenario for eye tracking included following tasks (not full list): find the official web page of Pilsen for visitors/tourists; find the newsletter sing-up; find information about parking in the city; find restaurants with place for children to play; find the page with beer events in Pilsen etc. Each respondent got through all defined tasks. His/Her behaviour had been monitored with the eye tracker, which also saved a video with the proceeding of the user while fulfilling the tasks. The eye tracking has been used for revealing obvious mistakes and trouble during the use of the web page. It did not try to discover specific design mistakes of the web page. The eye tracking scenario has been completed with semi-structured interviews, so the RTA (retrospective think aloud) method was applied (Hyrskykari et al., 2008). The eye tracking study has been conducted on a desktop computer. Therefore its outputs are not valid for portable devices such as tablets or smartphones.

For comparison purposes the authors compared the web page of Pilsen with tourist web pages of Ostrava and Hradec Králové. Both of those cities had been competing on national level with Pilsen in the competition for European Capital of Culture 2015. Therefore their tourism web pages seemed to be a good comparison choice for a research conducted in 2015.

The objective of the research was to evaluate both offline (and traditional) and online (and "new") communication means. An attempt to compare both nowadays mainstream, at least in the environment of the Czech Republic, instruments of communication with visitors/tourists – brochure, web page – has been partial objective of the conducted research.

3. Results and Discussion

3.1 Evaluation of the brochure

The brochure is offered in nine languages (11/2015). Figure 1 shows that analysed brochures can be divided into four categories according to the front page and published year: 2004 + 2007; 2008 + 2009; 2010 + 2011; 2013 + 2014 + 2015. The changes on the front page include the change of used logo (and visual manual), cover photo. Since 2013 the format changed from folding flyer to a brochure. Actual use of color is almost the same as on the web page (just yellow is missing on the web page). The content of the brochure changed only slightly and they

do not follow the changes in the design of the material. The biggest change happened between 2011 and 2013, the text information was reduced and only general information about the city is used, compared to more detailed information in previous versions. The number of pictures does not change during the years, the count is 17-18, but in the last version of the brochure less pictures covering one entire page are present. Thus less text in last version of the materials has not been exchanged for more pictures.

The use of colors in the brochure did change, until 2007 the main colors were yellow and red (partially pink), since 2008 the colors did change to blue, pink and white, 2010-2011 the use of colors were blue, yellow, white, black text and since 2013 in the brochure the use of colors is yellow, white, green and pink.

The results of the interviews showed following:

- the new format (brochure) is better (more practical) than folding flyer (100 % respondents),
- front pages were evaluated as positive,
- readability of the brochures was evaluated as very good,
- version from 2015 contains outdated pictures (e.g. picture from soccer game with a player not playing in Pilsen from 2012) – 10 respondents,
- colour combination (orange and yellow) in the years 2004 and 2007 were perceived as not suitable,
- 2009 version has been evaluated better than actual version due to more text information about sights in the city.

Concluding, authors state that the publisher of the brochures should especially consider:

- up-to-date pictures (with legends) and texts,
- choice of colours regarding readability and corporate image of the city communication,
- updating text information, alternatively extending the amount of text information.

The brochure does not use a QR code, which could link up the brochure with the web page. Such interconnection might solve the missing texts about tourism attractions in the brochure at least for technologically advanced users.

3.2 Evaluation of the web page

The evaluation of the web page has been conducted in several steps. The authors firstly analysed the web page (plzen.eu/turista) and its contents, signed in for the newsletter and prepared the scenario for eye tracking testing. Members of the authors´ team are dealing with web page analysis for several years (e.g. Tlučhoř, 2009; Janeček & Tlučhoř 2015; Janeček, Jakubíková & Tlučhoř 2015) using predominantly content analysis.

The web page is available in Czech, German and English. Facebook, Instagram and YouTube are used from the tourism authority of the city. Mobile application for Android, iOS and Windows 10 are available to download.

Used colours are white, pink, black, green and grey. Compared to print material the yellow is missing.

The first page (homepage) is long (need to scroll), but not on all devices it is clear that it continues and the user has to scroll down to obtain further information. This has been observed also during the eye tracking, when some respondents had trouble finding information, which were positioned lower on the first page. Figure 2 shows the first view on the examined homepage (before scrolling). It also includes the heat map, which shows the first moments of looking on the web page right after finding it. It is obvious that most respondents looked at the

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main menu, alternatively at the search field and link to actual culture programme. On the other hand nobody looked at the circled selection between citizens´ and tourists´ point of view.

Figure 2: Heat map (first view) for homepage plzen.eu/turista

Source: own research, 2015

Further results from eye tracking testing scenario and follow-up semi-structured interviews are:

- restaurants with amenities for children are not available to be found in the section Gastronomy (only in the section Visit),
- newsletter sing-up is not visible (an interview with the designer of the web page showed that visibility of this element has not been demanded),
- good use of colours (although considered as dark) and graphics,
- many useful information,
- useful information about parking and transportation in the city,
- web page is optimised for tablets – for some respondents it looks not arranged,
- better filter (search) options in the Gastronomy section, it is confusing for users (only two managed to find what they searched for),
- search engine does not provide relevant information.

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The newsletter functionality just automatically sends information about new articles on the web page, using the same Subject for all e-mails and not providing any value added. Therefore the clear conclusion is to completely rearrange this service (e.g. graphically advanced e-mails, possibility to choose frequency of sending newsletters, providing value added, not just overview of changes on the web page).

The authors also concluded comparative analysis with two other city web pages for tourists/visitors. The chosen cities were Ostrava and Hradec Králové. All three cities had been competing on the national level for the title European Capital of Culture 2015. The comparison overview provides Table 2, where "0" means acceptable, "+" perfect, "-" insufficient. The evaluation has been done by authors.

Table 2: Comparative analysis – web pages of Plzeň, Ostrava and Hradec Králové

Criterion	City		
	Plzeň	**Ostrava**	**Hradec Králové**
Web address	plzen.eu/turista	ostrava.cz/cs/turista	hradeckralove.org
Content	0	0	-
Languages	- (3)	+ (6)	- (2)
Layout	0	+	-
Navigation	+	+	0
Text size, graphics	-	0	+
Used colors	0	0	0
Usability	0	0	0
Accessibility	+	+	0
Domain	0	+	-
Visibility	-	0	-
Interaction with users	0	0	-

Source: own research, 2015

Hradec Králové does not have official web page for visitors/tourists, which explains some of the insufficient evaluation in some observed points. From the observed web pages the Ostrava´s seems to be the best. Nevertheless the Pilsen´s web page for tourists is satisfying, some possibilities for improvement showed previous findings.

Concluding, authors state that the publisher of the web page should especially consider:

- clearer "link"/advise to scroll on the homepage,
- improving newsletter,
- further research on graphic layout (different designs for different devices),
- improve search engine,
- improve filter (search) options in the Gastronomy section, it is confusing for users.

The web page does not provide electronic versions of printed promotional materials or at least a possibility to order them. Such functionality (content) would improve the integration between offline and online information provided to visitors/tourists.

4. Conclusion

The presented results of our qualitative evaluation of two selected means of online and offline communication of the city of Pilsen towards visitors/tourists showed that even qualitative research approaches (with limited numbers of respondents) could reveal serious imperfection in communication instruments used by a destination. The results were presented to the city authority and also to the developer of the web pages. They stated that the findings of the study

seem to be relevant and could improve the brochure and/or web page. Obviously such evaluation of the materials has not been conducted after publishing them.

Some of the imperfection of the web page has been discovered within the eye tracking part of the research which proofed that the cognitive walkthrough for the web (Habuchi, Kitajima, Takeuchi, 2008; Habuchi, Takeuchi, 2012) which is sometimes references as scan-path method (Coco, 2009) in combination with RTA interview (Hyrskykari et al., 2008) can deliver usable results.

The presented research has some limitations, e.g. limited number of respondents/evaluators, eye tracking on desktop solution (therefore no consideration of portable devices), but despite these imperfections the authors were able to deliver some applicable results.

Our prerequisite for selection of researched communication means – brochure, web page – has been their use of the majority of visitors/tourists (generality). In further research the intended and real target group of the communication material should be taken into the consideration, especially if examining more targeted communication instruments.

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SESSION 12

Agricultural markets and institutions – organized session by the Association of Agricultural Economists in Slovakia

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Infrastructure, institutions, and economic productivity in transition countries

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Abstract
Infrastructure is the foundation for development of any country. Weak institutions and poor infrastructure can slow down economic growth. In establishing our base proxy variable for institutions, we follow the typical transition literature and focus on a broad aggregated indicator of institutional change in transition, as well as on world governance indicators. As state of institutions can foster infrastructure investment and by this could have impact on economic output. Therefore, in the present study, we empirically investigate the impact of infrastructure, institutions on economic growth in transition countries for the period 1990-2013.In order to investigate the relationship and causality between the variables we use panel cointegration analysis and panel causality analysis. The VECM results indicated the existence of bidirectional causality between economic output, infrastructure index, and WGI both in the short and long-run. There is a negative and statistically significant estimated coefficient for the physical output. Furthermore, the estimation of the basic model showed that the labor force coefficient is positive and statistically significant, while infrastructure index has negative coefficient and statistically significant.

Keywords: *economic growth, Infrastructure, Institutions, Dynamic panel model*

JEL Classification: *O43, H54, L33, L9*

1. Introduction

The relationship between infrastructure capital and economic growth has been controversial (Esfahani and Ramirez 2003). A number of empirical studies have found high returns to infrastructure investment (Aschauer, 1989; Easterly and Rebelo, 1993). However, the robustness of the results has been questioned in other empirical studies and surveys (Munnell, 1992). An important concern has been endogeneity and the direction of causality between infrastructure and aggregate output.

A number of papers based on state-level panel data for the United States have shown that introducing long-run fixed effects may spread out the positive effect of infrastructure on output growth (Holtz-Eakin, 1994). Similarly, using a cross-country panel data, Canning and Pedroni (1999) find that allowing for heterogeneity in the short-run infrastructure–GDP interactions yields two-way causality in most countries. These results suggest that taking account of both endogeneity and heterogeneity in the steady-state as well as the short-run relationships between infrastructure and output may be important for gaining better insights into the returns to infrastructure investment.

As state of institutions can foster infrastructure investment and by this could have impact on economic output. Therefore, in the present study, we empirically investigate the impact of infrastructure, institutions on economic growth in transition.

Transition economies form an ideal set for study, as they have all been part of a natural experiment. Out of communism, they share a similar history. Moreover, they all faced the same shock as they abandoned communism and command economies; all inherited dysfunctional institutions. This shock and the following structural change cause a break between the levels of development (growth) and institutions (Paakkonen, J., 2010).

The goal of this paper is to provide a comprehensive empirical evaluation of the relationship between infrastructure index, institutions and economic output in transition countries using trans-log production function. To do this, we form a large data set of infrastructure indicators covering 31transition countries (Appendix 1) and covering the years 1990-2013.

The long and short run causality analyses are conducted by using vector error correction model (VECM). VECM, is based on different concepts of co-integration (Johansen, 1988; Pesaran et al., 2001), is an invention that helps to check the robustness.
The paper is structured in the following way: Section 2 develops the literature review about the theoretical link between infrastructure, institutions, and economic growth. Section 3 is about infrastructure development in transition countries. Data, methodological framework, and empirical methods are provided in Section 4. The empirical findings are reported and discussed in Section 6. Concluding remarks are given in Section 7.

2. The theoretical link between infrastructure, institutions, and economic growth (literature review)

The linkage between infrastructure and economic growth is not a one-dimensional one, rather multiple and complex. Infrastructure not only affects production and consumption directly but also creates many direct and indirect externalities and involves large flows of expenditure thereby creating additional income and employment. Infrastructure promotes growth and economic growth. In the literature, there are several studies examining the relationship between different physical infrastructure services and per capita income/output. These studies suggest that infrastructure does contribute towards the growth of output, income and employment of the economy and ultimately the quality of life of the people in the concerned economy (Aschauer 1989). Sarkar (1994) adopts principal components method to compute the infrastructure index. Bhatia (1999) constructed an index of rural infrastructure and his study revealed that the index of infrastructure significantly influences the per hectare yield of food grains in the state.

Aschauer (1989) initially developed a series of studies on this topic. His empirical works showed the essential importance of the investment on infrastructure to the development of economy. Munnell (1990) found high output elasticity of public infrastructure investment though comparatively lower than Aschauer (Pei Sun, 2009). Criticizing these earlier studies, there has been a spell of empirical tests on the link between infrastructure and economic growth using variety of data, empirical methods, and infrastructure measures (both quantity and quality) and controlling other variables affecting growth. Following Aschauer's early work, there has been a great number of studies using different data to support the conclusion that infrastructure is important to economy.

A more recent empirical literature, mostly in a cross-country panel data context, has confirmed the significant output contribution of infrastructure. Such result is reported, for example, by

Canning (1999) using panel data for a large number of countries and by Demetriades and Mamuneas (2000) using OECD data (Calderón and Servén, 2004).
Hulten (1997) and Canning and Pedroni (2004) show that optimal and efficient use of infrastructure is important for growth (Sahoo et al., 2012).

Calderón and Servén (2003a) presented empirical analysis with a focus on Latin America, using GMM estimates of a Cobb-Douglas production technology obtained from a large cross-country panel data set.

Most of the studies find positive long-run effect of infrastructure on output, productivity, or their growth rate using physical indicators of infrastructure stocks, but results are mixed or even negative among the growth studies using measures of public capital stocks or infrastructure spending flows (Straub, 2007).

Many authors agree that transition is largely a process of institutional change (North, 2005). However, the importance of institutions in transition is under investigation and it is still characterized with empirical gaps that need to be thoroughly investigated (Efendic et al., 2010).

Institutions are a "complex" phenomenon and empirical research cannot capture all of this complexity; hence, simplified institutional indicators and proxies need to be used in applied research (Williamson, 2000;). A huge disparity in using institutional proxies in empirical research, without any consensus in the direction of "unification", suggests that a single variable representing institutions is not available (Keefer and Knack, 1997). Consequently, the first methodological challenge for empirical research on institutions is to find an "adequate" quantitative proxy for the performance/quality/efficiency of institutions in transition (Efendic et al., 2010). Looking at previous transition research, most empirical investigations use the European Bank for Reconstruction and Development (EBRD) structural and institutional change indicators as proxy for institutions (Havrylyshyn et al., 1998;)(Efendic et al., 2010).

Recently, the role of institutions in influencing economic development has become one of the more dynamic areas of empirical work in economics North (1981).Numerous empirical studies have provided substantial evidence to support the view that differences in institutions can have a major effect on economic development. For example Knack and Keefer (1995) highlight that the quality of bureaucracy, property rights, and the political stability of a country all contribute to positive economic growth. Even though there has been increasing interest in the link between institutions and economic growth, far too little attention has been paid to the causality relationships between the two variables (Law et al., 2013).

3. Infrastructure development in transition countries

Whereas the literature on infrastructure and development abounds for Western industrial countries, little has been said on the topic on transition countries (Sugolov et al., 20113). The empirical research on economic growth in transition countries has thus taken into account mainly the conventional factors of the institutional infrastructure and the policy environment, such as initial conditions, privatization, and the legal environment (Sugolov et al., 20113). Havrylyshyn (1999) did studies related recovery and sustained growth in transition countries to the initial conditions of an economy at the outset of reforms, the speed of macro-stabilization, and the degree of structural reforms. Piazolo (1999) explicitly integrated a qualitative indicator of institutional change developed by EBRD (reflecting privatization and competition policy, amongst other policies) into cross-section estimations of an aggregate production function; he found institutional change to be a significant factor of growth in transition countries, suggesting that a more market-oriented approach would foster growth in the transition countries. In addition to the traditional institutional factors of growth, it has been argued that for transition

countries, the growth impact of material infrastructure investments and the liberalization of infrastructure sectors are particularly strong. Under socialism, infrastructure development was concentrated in few sectors, and the qualitative state was incompatible with the requirements of a market economy (EBRD, 1996). Estimates of the investment needed in transition countries to reach the average level of the European Union were above EUR 1,000 bn., or over 6% of annual GDP for at least 15 years; by contrast, real infrastructure investments during the 1990s covered not even 10% of the estimated requirements, pointing to a potential obstacle to sustained growth (Hirschhausen, 2002). Aghion and Schankerman (1999) suggest a particularly important role for infrastructure investments in transition countries; this is due to the extensive cost asymmetry between old, post-socialist firms (high-cost) and new, potentially more efficient firms (low-cost, e.g. unbundled parts of former combines, start-up firms). Infrastructure investments in transition countries then induce an expansion effect, leading to an increase in aggregate output, a selection effect whereby the low-cost firms increase their market share, and a market entry effect whereby new low-cost firms enter the market. According to this model, the dynamic effects of infrastructure investments increase with higher cost asymmetry between the firms, the initial market share of firms with high costs, the effort required for restructuring, and low costs of market entry for new firms; this constellation is exactly given in the transition countries. Apart from the absolute level of infrastructure equipment, the regulation of infrastructure sectors is also likely to affect the development of an economy (Sugolov et al., 20113).

The empirical evidence on the transition countries is scattered and thus far without conclusive results. The only sectoral econometric study by Meissner (1999) is available to-date, which covers the relation between the amount of road infrastructure and the competitiveness of the East European transition countries. Meissner finds a positive relation between the network density of roads (expressed in km of roads/km2) and the inflow of net foreign direct investment (which is taken as an indicator for competitiveness). With respect to the European transition countries, some unreliable evidence on the structural effects of early infrastructure investment comes from Hungary, where the privatization of infrastructure proceeded particularly quickly, e.g. in banking, telecommunication, and the energy sectors, but where most private investors were granted temporary monopoly status. This infrastructure plus the boost in reputation that Hungary achieved may have spurred the market entry effect by attracting significant amounts of foreign direct investment (Armstrong and Vickers, 1999, Hirschhausen, 2002).

4. Methodological framework and data

4.1 Production function based models

Two different forms of the production function approach are widely used. The first specification is the Cobb-Douglas specification. One issue with using the Cobb-Douglas approach is that the production function has the property of declining marginal productivity of input. As a result, regions that have low levels of capital per worker or low levels of road infrastructure per worker will automatically have higher rates of return (due to the higher marginal productivity of the respective inputs) than regions with higher input per worker levels (Lee, 2010).

The second form is the trans-log production function. The trans-log production function is a generalized version of the Cobb-Douglas. Using the trans-log specification over the Cobb Douglas approach has the advantage in that it allows for the estimation of the relationship between inputs (whether inputs are complements or substitutes) in the aggregate production function. In addition, the specification allows for the possibility that the output elasticity with respect to infrastructure investment may ardiffer across states (Lee, 2010).

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The following generalized form of trans-log production function, which takes into account a number of n inputs (production factors), is used in this study:

$$ln\,Y = lnA_{\alpha_i,\beta_{ij}} + \sum_{i=1}^{3} \alpha_i \; ln\,X_i + \left(\frac{1}{2}\right) \sum_{i=1}^{3} \sum_{j=1}^{3} \beta_{ij}\, lnX_i \; ln\,X_j \qquad (1)$$

where Y is total output, A is total factor productivity, X is the set of explanatory variables. The translog function is a flexible function. This function has both linear and quadratic terms with the ability of using more than two factor inputs. The five-input translog production function can be written in terms of logarithms as follows:

$$\ln Y = \lambda + B_L \ln L + B_K \ln K + B_I \ln Infraindex + B_E \ln EBRDI + B_W lnWGI + 1/2B_{LL}\, lnL^2 + 1/2B_{KK}\, lnK^2 + 1/2B_{II}\, lnInfraindex^2 + 1/2B_{EE}\, lnEBRDI^2 + 1/2B_{WW}\, lnWGI^2 + B_{LK} \ln LlnK + B_{LI} \ln LlnInfraindex + B_{LE} \ln LlnEBRDI + B_{LW} \ln LlnWGI + B_{KI} \ln KlnInfraindex + B_{KE} \ln KlnEBRDI + B_{KW} \ln KlnWGI + B_{IE} \ln Infraindex \ln EBRDI + B_{IW} \ln InfraindexlnWGI + B_{EW} \ln EBRDI lnWGI \qquad (2)$$

Where Y is the output level of the country, L is the labor force, K is the physical output, Infraindex is the comprised index of six infrastructure variables, EBRDI is the EBRD indicator and finally WGI is the worldwide governance indicators. λ is the intercept or the constant term. B_L B_K B_I B_E and B_W are the first derivatives. $B_{KK} B_{LL} B_{EE} B_{WW}$ are own second derivatives. B_{LK} B_{LI} B_{LE} B_{LW} B_{KI} B_{KE} B_{KW} B_{IE} B_{IW} and B_{EW} are cross second derivatives.

4.2 Data sources

In order to evaluate the effect of infrastructure development on economic growth, we have gathered a panel data set for 31 transition countries over 1990-2013 period. We use annual data for these transition countries. Our panel data set is unbalanced since we do not have complete information for all countries over the sample period (Calderón, 2009).

Annual data of the dependent variable; the output level of the country (Y), was measured by Purchasing Power Parity of Real Gross Domestic Product (chain index) at 2005 constant prices. The physical output K; the proxy of the investment to GDP ratio, at 2005 constant prices are taken from Penn World Tables 7.0. The labor force (L) figures are taken from International Labor Organization (ILO). Six Infrastructure variables used for constructing infrastructure index are taken from World Development Indicators CD-ROM, World Bank, 2014.

The institutional quality variables are represented through the European Bank for Reconstruction and Development (EBRD) indicator and the Worldwide Governance Indicators (WGI). The transition indicator scores reflect the judgment of the EBRD's Office of the Chief Economist about country-specific progress in transition. The scores are based on the following classification system, which was originally developed in the 1994 Transition Report, but has been refined and amended in subsequent reports. EBRD Indicator is scored from 1.0 (minimum) to 4.3 (maximum). WGI consist of six composite indicators of broad dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. WGI are measured in the standard normal units of the governance indicator ranging from around -2.5 to 2.5. The study period is 1990-2013.

4.3 Determination of infrastructure index

We follow the strategy pursued in Calderón and Servén (2009) and previously in Alesina and

Perotti (1996) and apply principal component analysis to develop a composite index of major infrastructure indicators; our synthetic indices are given by the first principal component of the underlying variables.

Principal components analysis (PCA): As above mentioned the aggregate index of infrastructure stock was created constructed using the PCA method. This method involves a mathematical procedure that transforms a number of correlated variables into a smaller number of uncorrelated variables called principal components. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible. That is, the method generates those linear combinations of object measures (called eigenvectors), which express the greatest statistical variance over all of the objects under consideration. This is particularly useful when there are hidden dependencies between different object measures.

Implementation of the Principal component analysis (PCA) was done using STATISTICA 7 software package. The first principal component of the PCA was then used to derive weights (scores) for the infrastructure index (See Appendix 2 (Badalyan et al., 2015), for details).

Log (InfraIndex) = 0.230556*(Log(PCEPC) + 0.319373*(Log(PCEU)) + 0.154109*(Log (TL))+0.308260*(Log(RD))+0.143461*(Log(AT))+0.194273*(Log(PR)) (3)

Where InfraIndex is the value of the aggregate infrastructure measure and the score coefficients being regarded as weights (Theil 1970). Based on equation 3, we created the infrastructure index for each observation.

The infrastructure index was created by taking six major infrastructure indicators such as (1) Per capita Electricity Power consumption (PCEPC); (2) Per capita Energy use (kg of oil equivalent) (PCEU); (3) Telephone line (both fixed and mobiles) per 100 persons (TL); (4) Rail Density per 100 persons (RD); (5) Air Transport, freight million tons per kilometer (AT); (6) Paved road as percentage of total road (PR). Our infrastructure index is mixed of both quality and quantity. All variables are expressed in logs.
The eigenvalues and respective variance of these factors are given in Appendix 2 Table 2.2 (Badalyan et al., 2015). The first principal component has an Eigen value larger than one and explains over one half of the total variance. There is a large difference between the eigenvalues and variance clarified by the first and the further principal components (Sahoo et al., 2012). Therefore, we have chosen the first principal component for making composite index representing the combined variance of infrastructure captured by the six variables.

5. Econometric analysis (methods)

Panel unit root test: Panel unit root tests are used to examine the degree of integration between the variables. To assess the stationarity properties of the variables used. In this study we have used five different panel unit root tests including LLC test proposed by Levin, Lin and Chu (2002); IPS test proposed by Im, Pesaran and Shin (2003), Breitung (Breitung , 2000) and Hadri (Hadri, 2000).

Panel co-integration test: We test for co-integration using the panel co-integration test developed by Pedroni (1999, 2004). This test allows for heterogeneity in the panel by permitting heterogenous slope coefficients, fixed effects, and individual specific deterministic trends. Pedroni (1999, 2004) proposed two types of co-integration tests: panel tests and group tests. The first group of tests is termed "within dimension". It includes the panel-v, panel rho(r), panel non-parametric (PP) and panel parametric (ADF) statistics. Second, the group tests based on the between dimension method (i.e. group mean panel co-integration statistics test) which includes three statistics: group rho-statistic, group PP-statistic, and group ADF-statistic. These

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seven statistics are asymptotically distributed as standard normal and the detailed description of panel co-integration test statistics can be found in Pedroni (1999, 2004). The seven of Pedroni's tests are based on the estimated residuals from the following long run model:

$$y_{it} = \alpha_i + \sum_{j=1}^{m} \beta_{ji} x_{jit} + \varepsilon_{it} \qquad (4)$$

where i= 1; . . . ;N for each country in the panel and t= 1, .., T refers to the time period. The parameter α_i allows for the possibility of country-specific fixed effects. The estimated residuals, denoted by ε_{it}; represent deviations from the long-run relationship. The null hypothesis of no co-integration, ρ_i =1, is tested by conducting a unit root test on the residuals as follows:

$$\varepsilon_{it} = \rho_i \, \varepsilon_{i(t-1)} + w_{it} \qquad (5)$$

In our empirical analysis, we used two cointegration test methods. The first set of tests is Pedroni (2004). The second set of test is Kao (1999).

All the tests involve the null hypothesis of no cointegration and use the residuals derived from a panel regression to construct the test statistics and determine the distributions. After appropriate standardization, all the test statistics have an asymptotic distribution.

Vector Error Correction Model (VECM): The standard error-correction procedure is a two-step method. First estimating the long-run model to obtain the estimated residuals. Next, defining the lagged residuals from co-integration as the error correction term, the following dynamic error correction model is estimated:

$$\Delta Y_{it} = \xi_{1j} + \sum_{k=1}^{q} \psi_{11ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{12ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{13ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{14ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{15ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{16ik} \Delta WGI_{it-k} + \lambda_{1i} \varepsilon_{it-1} + u_{1it} \quad (5a)$$

$$\Delta L_{it} = \xi_{2j} + \sum_{k=1}^{q} \psi_{21ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{22ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{23ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{24ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{25ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{26ik} \Delta WGI_{it-k} + \lambda_{2i} \varepsilon_{it-1} + u_{2it} \quad (5b)$$

$$\Delta K_{it} = \xi_{3j} + \sum_{k=1}^{q} \psi_{31ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{32ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{33ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{34ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{35ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{36ik} \Delta WGI_{it-k} + \lambda_{3i} \varepsilon_{it-1} + u_{3it} \quad (5c)$$

$$\Delta I_{it} = \xi_{4j} + \sum_{k=1}^{q} \psi_{41ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{42ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{43ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{44ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{45ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{46ik} \Delta WGI_{it-k} + \lambda_{4i} \varepsilon_{it-1} + u_{4it} \quad (5d)$$

$$\Delta EBRDI_{it} = \xi_{5j} + \sum_{k=1}^{q} \psi_{51ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{52ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{53ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{54ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{55ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{56ik} \Delta WGI_{it-k} + \lambda_{5i} \varepsilon_{it-1} + u_{5it} \quad (5e)$$

$$\Delta WGI_{it} = \xi_{6j} + \sum_{k=1}^{q} \psi_{61ik} \Delta Y_{it-k} + \sum_{k=1}^{q} \psi_{62ik} \Delta L_{it-k} + \sum_{k=1}^{q} \psi_{63ik} \Delta K_{it-k} + \sum_{k=1}^{q} \psi_{64ik} \Delta I_{it-k} + \sum_{k=1}^{q} \psi_{65ik} \Delta EBRDI_{it-k} + \sum_{k=1}^{q} \psi_{66ik} \Delta WGI_{it-k} + \lambda_{6i} \varepsilon_{it-1} + u_{6it} \quad (5f)$$

where Δ is the first-difference, k is the lag length set at one based on likelihood ratio tests, and u is the serially uncorrelated error term. From (5a) to (5f), short-run causality is determined by the statistical significance of the partial F-statistic associated with the corresponding right hand side variables. Long-run causality is revealed by the statistical significance of the respective error correction terms using a t-test. Short-run causality is determined by the statistical significance of the F-statistic. The presence (or absence) of long-run causality can be established by examining the significance using a t-statistic on the coefficient λ, of the error correction term, εit-1 in 5(a)-5(f) equations (Badalyan et al., 2014).

6. Empirical results

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Table 1 shows the descriptive statistics of economic output, physical output, labor force, EBRD indicator, infrastructure index, WGI.

Table 1: Descriptive Statistics

	Mean	Sd	Min	Max
Y	7887.60	5321.01	770.13	27611.42
K	20.41	7.61	3.33	47.43
L	7191.51	14365.59	254.18	76650.03
EBRDI	3.10	0.62	1.17	4.06
INFRA_INDEX	1.16	0.77	0.00	3.55
WGI	-0.19	0.72	-1.66	1.13

Source: Own elaboration

6.1 Panel unit root tests results

In Table 2 the results of the LLC, IPS, Breitung and Hadri panel unit root tests for each of the variable are presented. We have performed each test for the level and first difference for all variables.

Table 2: Panel unit root test results

Null: unit root				Null: No unit root	
Methods	LLC	Breitung t-stat	IPS	Hadri Z-stat	Heteroscedastic consistent Z-stat
Variables					
Level	Y -1.107	8.194	0.576	6.300***	4.661***
	K -0.449	0.267	-0.162	7.459***	5.012***
	L -1.441	2.951	-0.877	4.418***	3.076***
	InfraIndex 0.560	1.607	0.500	3.575***	2.775***
	EBRDI 0.987	0.705	-1.257	2.341***	1.998**
	WGI -2.406	0.711	-1.666		
First difference	Y -4.491***	-4.114***	-5.229***	0.554	0.272
	K -7.691***	-1.448*	-8.978***	0.541	0.136
	L -2.771***	-4.297***	-6.211***	0.153	0.259
	InfraIndex -4.505***	-9.616***	-9.617***	0.012	-0.134
	EBRDI -3.762***	-3.762***	-7.728***	0.840	0.882
	WGI 19.809***	-6.876***	-9.088***		

Source: Own elaboration

Notes: Δ denotes the first difference. The optimal lag length is selected automatically using the Schwarz information criteria.

*** Indicate that the parameters are significant at the 1% level.

** Indicate that the parameters are significant at the 5% level.

* Indicate that the parameters are significant at the 10% level

In Table 2 For the variables in level form, the null hypothesis is rejected for the IPS LLC, , Breitung tests, while the Hadri test rejects the null hypothesis at the 1% significance level for all variables. After taking the first difference, the first three tests reject the null hypothesis almost at the 1% significance level. So, we can conclude that all variables (in first differences) are stationary and integrated of order one or I(1).

The null hypothesis is that the variable follows a unit root process, except for the Hadri Z-stat and the Heteroscedastic All other tests assume asymptotic normality.

6.2 Panel cointegration test results

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For the robustness check, this paper used two kinds of panel cointegration tests, i.e. Pedroni's (2004), Kao's (1999) panel cointegration tests. Table 3 reports the within and between dimension results of the panel cointegration tests. As shown in Table 3, the results of Pedroni's (2004) heterogeneous panel tests indicate that the null of no cointegration can be rejected at the 1% and 5% significance levels except for the panel rho-statistic and the group rho-statistic.

Table 3: Pedroni residual cointegration test results (Y as dependent variable)

	Statistics	Probability
Within dimension		
Panel v-Statistic	-2.238**	0.040
Panel rho-Statistic	3.497	1.000
Panel PP-Statistic	-2.885***	0.002
Panel ADF-Statistic	-3.053***	0.001
Between dimension		
Group rho-Statistic	6.379	1.000
Group PP-Statistic	-7.441***	0.000
Group ADF-Statistic	-5.786***	0.000

Source: Own elaboration

Notes: The null hypothesisis that the variables are not cointegrated.Under the null tests,all the statistics are distributed as normal(0,1).

*** Indicate that the parameters are significant at the 1% level.

* Indicate that the parameters are significant at the 10 % level

Table 4 reports the results of Kao's (1999) residual panel cointegration tests, which reject the null of no cointegration at the 5% significance level. We conclude that there is a panel long-run equilibrium relationship among variables, meaning that institutional variables, infrastructure, and economic productivity move together in the long run

Table 4 : Kao's residual cointegration test results (Y as dependent variable)

	t-statistic	Probability
ADF	-1.583**	0.05

Note: The ADF is the residual-based ADF statistic (Kao, 1999).

** Indicates that the parameters are significant at the 5% level.

6.3 Panel causality results

Taking into consideration the basis of cointegration results, VECM was used to estimate the direction of causality. The results of the VECM with six simultaneous equations for the analysis of the causal relationships between explanatory variables are presented in Table 5. We report the results of the short-run and long-run Granger-causality tests for panel. The optimal lag structure of one year is chosen using the Akaike and the Schwarz Information Criterions.

Table 5. Panel causality test results

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	Source of causation(independent variable)									
	Short run							Long run		
	Δ Y	ΔK	ΔL	ΔINFRA_INDEX	ΔEBRDI	ΔWGI		ECT1	ECT2	ECT3
			0.968	1.386*	5.739**	0.089	3.093**	-0.061***	-3.057**	2.745
			(0.38)	(0.09)	(0.05)	(0.79)	(0.05)	(0.00)	(0.05)	(0.13)
Δ Y	-		[1.27]	[1.77]	[3.31]	[0.42]	[2.14]	[-2.75]	[-0.65]	[1.49]
	19.738***			0.227	0.981	0.250	0.186	-3.035***	-0.211***	-1.37
	(0.00)			(0.79)	(0.37)	(0.61)	(0.82)	(0.00)	(0.00)	(0.99)
ΔK	[4.44]		-	[-0.66]	[-0.96]	[0.50]	[-0.59]	[-4.36]	[-5.63]	[-0.06]
	0.230		2.289		0.049	0.467	0.087	-0.018*	3.874	0.012***
	(0.63)		(0.59)		(0.82)	(0.49)	(0.76)	(0.002)	(0.32)	(0.00)
ΔL	[-0.47]		[-0.53]	-	[0.21]	[0.68]	[-0.30]	[2.93]	[0.97]	[7.86]
	6.164***		0.157	0.280		0.148	2.785**	-1.945***	0.008	-1.416
	(0.00)		(0.94)	(0.59)		(0.69)	(0.05)	(0.00)	(0.55)	(0.55)
ΔINFRA_INDEX	[-2.48]		[-1.98]	[0.52]	-	[0.38]	[-1.68]	[2.27]	[0.58]	[-0.56]
	5.551***		0.278	2.252*	0.374		0.128	-4.876***	-0.163*	-1.657
	(0.00)		(0.59)	(0.10)	(0.54)		(0.72)	(0.00)	(0.05)	(0.59)
ΔEBRDI	[-2.35]		[0.53]	[-1.50]	[-0.61]	-	[-0.35]	[-4.56]	[-1.68]	[-0.52]
	1.977*		0.010	1.355	0.921	1.783*		-3.1060**	0.027	0.013
	(0.10)		(0.91)	(0.24)	(0.33)	(0.09)		(0.04)	(0.84)	(0.77)
ΔWGI	[1.46]		[0.10]	[-1.16]	[0.95]	[-1.48]	-	[-2.83]	[-0.20]	[0.29]

Source: Onw elaboration

Notes: Figures denote F-statistic values. p-values are in parentheses, t-statistics are in brackest . ECT indicates the estimated error-correction term.

* Indicate that the parameters are significant at the 10% level.

** Indicate that the parameters are significant at the 5% level.

*** Indicate that the parameters are significant at the 1% level.

The significance of causality tests are determined by the Wald F-test. According to Table 5 Eq. (5a) shows that labor force, infrastructure index and WGI have a positive and statistically significant impact in the short- run on economic output. On the other hand, the impact of physical output, EBRD indicator, are positive and statistically insignificant in the short-run. This highlights the importance of WGI components and infrastructure on economic output in transition countries. Furthermore, the error correction term is negative and statistically significant at 1% and denotes the speed of adjustment to long-run equilibrium.

From Eq. (5b), it appears that economic growth has positive and statistically significant impact in the short- run on physical output, while the impact of other variables is statistically insignificant. The error correction term is statistically significant at 1% and assumes that physical output variable responds to deviations from long-run equilibrium.

With regard to Eq. (5c), the impact of variables is not significant, but there is evidence for long-run adjustment, because the error correction term is statistically significant at 10%. With respect to Eq. (5d), economic output and WGI have a negative and statistically significant impact on infrastructure index in the short-run. The impact of other variables is not statistically significant. In Eq. (5e), economic output and labor force have negative and significant impact on EBRD indicator, whereas other three variables are statistically insignificant. Finally, in Eq. (5f) economic output and EBRD indicator have positive and statistically significant impact on WGI, while other variables are not significant.

Regarding long-run dynamics, based on the statistical significance of the error correction terms for Eq. (5d), (5e) and (5f), infrastructure index and EBRD indicator are statistically significant at 1% and denotes the speed of adjustment to long-run equilibrium, but WGI is significant at 5 %. Overall, the existence of bidirectional causality between economic output, infrastructure index, and WGI was indicated in both the short and long-run.

7. Conclusion

We have also investigated the causal relationships between the studied variables such as economic output, physical output, labor force, infrastructure and institutional variables in transition courtiers. For this purpose, unit root tests for panel, panel cointegration and causality techniques have been applied. Using panel unit root tests we found out that all variables are

non-stationary in level but when taking first difference became stationary and integrated of order one or I(1). For the robustness check, this paper used two kinds of panel cointegration tests, i.e. Pedroni's (2004) and Kao's (1999) panel cointegration tests. The tests proved the existence of cointegration. This means that the long-run relationship exist between variables. So they move together over time and that short-term disturbances will be corrected in the long-term. The VECM results indicated the existence of bidirectional causality between economic output, infrastructure index, and WGI both in the short and long-run. There is a negative and statistically significant estimated coefficient for the physical output. Furthermore, the estimation of the basic model showed that the labor force coefficient is positive and statistically significant, while infrastructure index has negative coefficient and statistically significant.

The initial estimates of the model verify the importance of infrastructure investment for economic growth and state of institutions on economic output and infrastructure in the long-run growth.

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Appendices

Appendix 1: List of Transition Countries

Table 1.1 List of countries

	Country		Country
1	Albania	19	Moldova
2	Armenia	20	Mongolia
3	Azerbaj	21	Montenegro
4	Belarus	22	Poland
5	BH	23	Romania
6	Bulgaria	24	Russia
7	China	25	Serbia
8	Croatia	26	Slovak Republic
9	Czech republic	27	Slovenia
10	Estonia	28	Tajikstan
11	Georgia	29	Turkmenistan
12	Hungary	30	Ukraine
13	Kazakhstan	31	Uzbekistan
14	Kosovo		
15	Kyrgizstan		
16	Latvia		
17	Luthiania		
18	Macedonia		

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Factors affecting the food gap and the share of self-sufficiency of selected commodities: the case of Arab countries

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Abstract
Agriculture and food situation has entered in the Arab world since the mid-seventies in a critical stage, due to the growing demand for food and agricultural products in particular, high population growth rates, in addition to high food prices in the global markets and shrinking of the relative importance of the agricultural sector in the Arab economic structures. This has resulted in worsening food shortages and therefore resorts to foreign sources to fill the food deficit. Therefore, in this the paper we tried to identify the most important factors affecting the problem of the growing food gap, and the deterioration of self-sufficiency rates of selected food commodities (wheat and flour, maize, rice, red meat, white meat). We chose these goods based on their relative importance. In spite of the importance of productivity, the share of these commodities in the value of food imports exceeds production rates. So, we have set up methodological framework that includes estimating equations of general time trend during the period 2000-2013, expected future quantities of the food gap, and identify the most important factors affecting the amount of the gap and the share of self-sufficiency of goods under study. The main findings reveal that Arab countries are significantly exposed to the FNS risks, mainly driven by the food trade deficit between Arab countries, high unemployment, and high population growth rates. This resulted in the expansion of the size of the food gap between domestic production and national consumption of those goods and declining self - sufficiency rate of those goods. Therefore, they rely on foreign sources to fill the deficit. The Arab food integration is one of the most important reasons for achieving the Arab food security strategy. As this integration will bring significant economic advantages of the Arab world, it might increase the volume of trade exchange between Arab countries, on the one hand, and between the Arab world and foreign markets, on the other.

Keywords: food security, food gap, self-sufficiency rates, Arab countries

JEL Classification: Q18, Q21

1 Introduction

"Food Security" is one of the major elements of development and poverty alleviation and has been the goal of many international and national public organizations. The issue is so important that according to the state of food insecurity in the world 2012 published by FAO around 870 million people (out of which 852 million from developing countries) are estimated to have been undernourished in the period 2010-2012 (Food and Environment.2013). A recent study confirms that the increased demand for agricultural commodity's rates with no compatibility with the growth of agricultural production. This will lead to a widening food gap in the Arab world in the most food commodities and produces the Arab world is less than 70% of its food needs (Said.2010). it is increasingly being

recognized that, due to a confluence of factors, international food commodity prices are likely to exhibit a rising and more volatile medium-term trend. This trend is of particular concern for Arab countries because of their rapidly growing populations, limited water and arable land resources, and significant dependence on international food commodity markets. Arab countries want and need to act urgently to improve food security. Projections of the region's food balance indicate that depend on imports will increase by almost 64% over the next twenty years. Going forward, we need to deploy together our efforts to help offset vulnerability to future food price shocks in the region by focusing on investment in three key areas: (i) Strengthening safety nets; (ii) Enhancing food supply; and (iii) Reducing exposure to international commodity market volatility (Akhtar.2011). The dramatic rise in food prices, the growing disparity between production and population. The latest in the Arab world, especially big gap size was in 2010, nearly 40 billion dollars, in light of the continued rise in the number of residents at an annual rate of up to about 2.5 per cent of the total population of nearly 400 million people. All this latest bitter reality casts a shadow over the poor (Shaheen.et al 2014).

2 Material and methods

Based on some standard methods. we will use equations of general time trend. Where we will show the relationship between Commodity balance variables of selected commodities, with time. By using Eveiws 6 program. The primary purpose of time-series analysis is to find suitable to measure changes and thus the study of their relationship to the different circumstances of the way (Alloush.2013). So we use the time as an independent variable X and Y values of the series as the dependent variable. The equation is:

$$\hat{y} = \hat{a} + \hat{b}x \ldots\ldots(1)$$

Where: $\hat{a}$: the lump is part of the vertical axis, $\hat{b}$: mi trend line, $\hat{y}$: the value of the phenomenon directivity, x: time guide (start the One for the first time and then two second period and so on ....).

$$\hat{b} = \frac{\sum xy - nxy}{\sum x^2 - nx^2} \ldots\ldots\ldots(2)$$

And:

$$\hat{a} = y - \hat{b}x \ldots\ldots\ldots(3)$$

Expectation size of future food gap of selected commodities. By measuring the general trend of the time series can be identified in the behavior of this series in the past, present, and then it can be used as a basis to predict the future (Shorbaj.1994). This method produces a mathematical equation by equation represents the general trend, which may be linear, or exponential (Fadel.1984). As in the equation (1), (2).

$$yt = m * t + c \ldots\ldots\ldots (4)$$

$$yt = m * c\ t. \ldots\ldots\ldots\ldots (5)$$

Where: yt : the amount of time series in time t; c, m: numerical constants.

Here we try to formulate a model for food gap and appreciate its features and predict its path in the future gradient manner, and will use a computer package (Eviews 6). In addition, we will use the regression model multi-phased in multiple forms. therefore, we aim to reach the equation similar to the following equation:

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$$Y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots\ldots\ldots + \beta_k x_{ik} + \varepsilon_i \quad \ldots\ldots\ldots\ldots\ldots(6)$$

$$Yi = \beta_0 + \sum_{J=1}^{K} \beta j x ij + \varepsilon_i \quad \ldots\ldots(7)$$

$$i = 1, 2\ 3, \ldots\ldots\ldots\ldots, n.$$

Where y: dependent variable, x: independent variables, ($\beta_0, \beta_1, \beta_2, \ldots\ldots\ldots, \beta_k$) : Express regression parameters, ε_i : Random error to watch.

In this the paper, we relyed on statistical data from publications and periodicals published by the World Bank, IMF, FAO, AOAD and the economic literature on the phenomenon of food security.

3 Results and discussion

3.1 Food and Nutrition Security (FNS) : The Case of Arab Countries

3.1.1 Economic growth and development constraints in Arab countries

In 2013, the average real GDP growth rate of the region is projected at 4.4%. The GDP growth rate on average is likely to taper off due to the decline in energy export revenues which marked a historic high in 2012. At the same time, net energy importing countries in the region is struggling to stabilize their economies amid worsening foreign exchange constraint.

Table 1 : Real GDP growth rate and consumer price inflation (Annual percentage change)

Area	Real GDP growth					Consumer price inflation				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
GCC countries	-0.7	4.6	6.6	5.7	4.7	2.7	2.6	2.9	2.2	3.7
Arab Mashreq	5.6	5.1	2.2	-1.7	2.6	6.5	7.7	7.6	11.4	9.3
Arab Maghreb	2.5	3.6	-9.3	10.6	5.3	3.6	3.0	5.5	5.7	3.9
Arab LDCs	5.1	5.5	-2.3	-4.6	3.2	9.5	11.6	17.2	24.6	16.5
Total Arab region	**1.3**	**4.5**	**2.2**	**4.8**	**4.4**	**3.9**	**3.9**	**4.9**	**5.5**	**4.8**

Source; UN (United Nations). 2013. Survey Of Economic And Social Developments In The Arab Region, New York. http://www.escwa.un.org/information/publications/edit/upload/E_ESCWA_EDGD_13_2_E.pdf

The Arab world has the highest unemployment rate in the world. It is estimated that this rate has deteriorated from 14% before the events of the "Arab spring" in 2011 to no less than 16% currently. This happens while sectors like tourism, information technology, banking and construction are booming in many countries, but employers face difficulties in finding the necessary technical skills. high population growth leads to large numbers of young people entering the workforce every year, while growth in the Region has not been sufficient to create an appropriate number of jobs. The major reason for this is the low level of economic integration between the member countries of the Region

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Table 2: The change in unemployment rates in selected Arab Countries. (% of Labor force)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Algeria	17.7	15.3	12.3	13.8	11.3	10.2	10.0	10.0	10.4	10.2
Egypt	10.3	11.2	10.7	8.9	8.7	9.4	9.0	12.0	12.5	13.1
Morocco	10.8	11.1	9.7	9.8	9.6	9.1	9.1	8.9	9.0	9.1
Tunisia	-	12.9	12.5	12.4	12.4	13.3	13.0	18.3	17.4	17.0
Jordan	12.5	14.8	14.0	13.1	112.7	12.8	12.5	12.9	12.2	13.1
Saudi Arabia	5.8	6.1	6.3	6.1	6.3	6.3	6.2	5.9	5.6	5.7
Developed countries	-	6.9	6.3	5.8	6.1	8.4	8.8	8.5	8.5	8.6

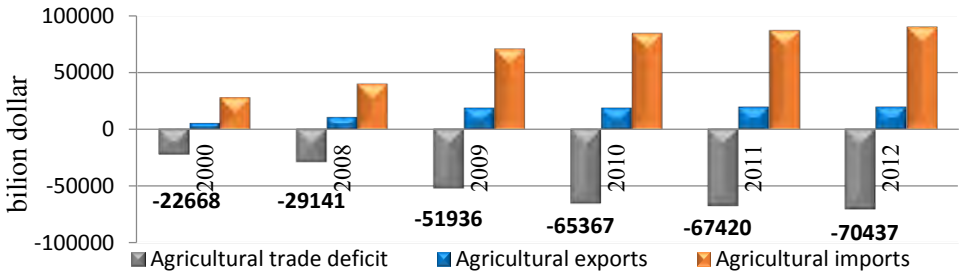
Source: (GUCCIAAC) The General Union of Chambers of Commerce, Industry & Agriculture for Arab Countries. 2014. The Arab Economy- a Private Sector's Perspective For a Better Business Climate.

http://www.ammanchamber.org.jo/Uplaoded/PRFiles/The%20arab%20aconomy.pdf

3.1.2 Constraints of agricultural sector in Arab countries

Agriculture accounts for most important economic sectors in the Arab countries. In terms of the weakness of the technical level of the Arab cultivation (80%) of them were traditional cultivation depends on the cultivation of rain. One of the most important obstacles facing the Arab agriculture is a set of utmost importance and economic gaps in economic development, including: technical gap, the food gap, the institutional gap, reflected by the low level of agricultural services of guidance and research, marketing and other financing gap, resulting from deficiencies in the investment in infrastructure, and refrain from investments in joint agricultural projects.

Figure 1 : Agricultural trade balance of agricultural sector in the Arab countries (2000, 2008-2012)



Source : IMF (International Monetary Fund). 2014. Unified Economic Report: agriculture and water sector, Chapter III, p 65

3.2 Features Of The Food Crisis In The Arab Countries

3.2.1 The contribution of agricultural output in GDP for the Arab countries

The GDP growth rate on average is likely to taper off due to the decline in energy export revenues, which marked a historic high in 2012. The data indicate development programs and policies during the current decade to the decline in the relative importance of the agricultural output in the GDP of the Arab countries as a group. With the corresponding figure of 7.8 % in 2000 and 5.6 % in 2011 (AMF.2012). In 2012 total agricultural GDP value about (139.1) billion dollars (5.4%) of the Arab GDP and in 2013 AGDP was (136,251) billion dollars

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(5.0%) of the Arab GDP (AOAD.2013). See Figure 2.

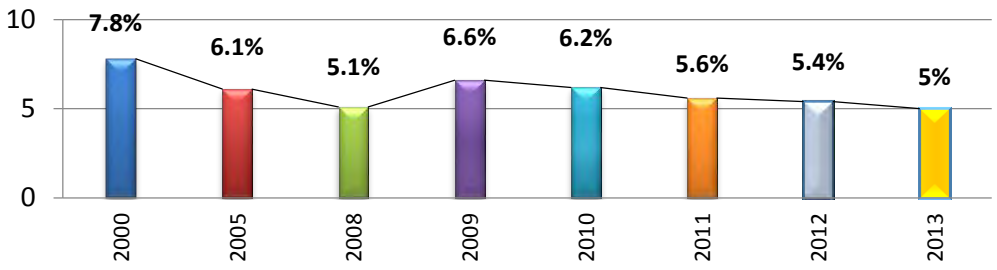


Figure 2: The contribution of Arab agricultural output in GDP

***Source*:** Arab Monetary Fund, 2012. Unified Arab Economic Report. www.amf.org.

Arab Organization for Agricultural Development. 2011,2013. Arab food security situation. *http:// www.aoad.org/*

3.2.2 The relative importance of selected food commodities

Operates grain crops (65.6%) of cultivated food crops in the area of Arab States in 2013, with a total production (55.5) million tonnes. Tops the production of wheat in the grain group by about (50%), then maize, rice and barley by (15.8%), (12%), (11.9%) respectively. contribute red and white meat by (37.5%), (62.5%), respectively, of the total meat production in 2013. a concentrated food gap in certain commodities the most important grain group that contributes only about (53.62%) of the value of the gap, while meat contributes by (16.45%), and varying the Arab states in the amount of their contribution to the value of the Arab food gap according to the consumption patterns of the population, and income levels and Agricultural available capacity.

Figure 3: The relative importance of cereal crops of the total production in 2013

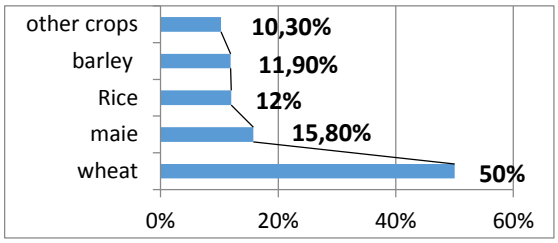
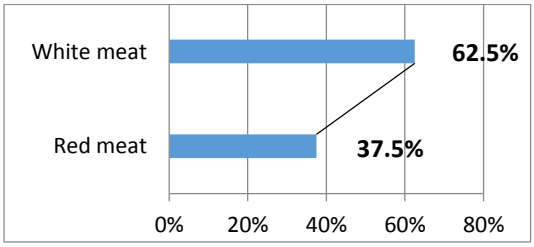


Figure 4: the relative importance of meat of the total meat production in 2013



***Source*:** Arab Organization for Agricultural Development. 2013. Arab food security situation.

http:// www.aoad.org/

Figure 5: The contribution of selected commodities in the value of the food import

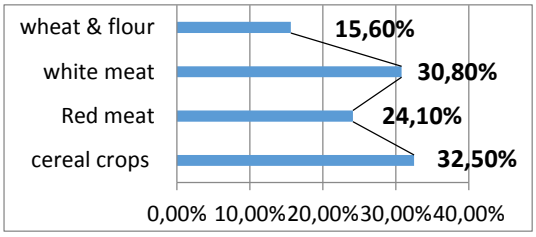
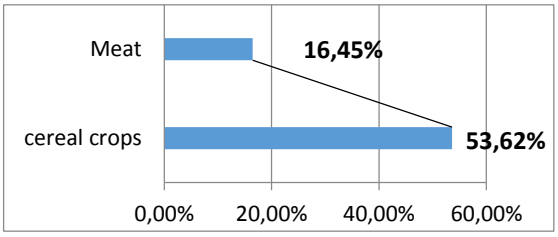


Figure 6:The contribution of selected commodities in the value of the food gap



***Source*:** Arab Organization for Agricultural Development. 2013. Arab food security situation.

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3.2.3 Economic analysis of the evolution of commodity balance variables of the Arab selected food commodities in the world (2000- 2013)

In spite of increased domestic production of major food commodities, but the rapid and steady increase in population has led to increased domestic consumption of major food commodities at rates much higher than the domestic production growth rates.

Table 3: The equations of the general trend of commodity balance variables of the most important food commodities in the Arab world during the period 2000-2013.

Commodity balance variables		Fixed formula (a)	Regression coefficient (ß)	No Equation	The coefficient of determination (R^2)	T- calculated Test	F- Test
he amount of production (a thousand tons)	Wheat & flour	21665.46	409.7836	(1)	0.20	(1.758783)	3.093317
	Maize	6992.621	84.78758	(2)	0.33	2.448100*	5.993193
	Rice	6319.890	14.19960	(3)	0.01	(0.260926)	0.068082
	Red meat	3538.967	113.2445	(4)	0.92	12.07338**	145.7666
	White Meat	2285.417	99.23325	(5)	0.71	5.522001**	30.49250
Available for consumption (a thousand tons)	Wheat & flour	38863.09	1745.214	(6)	0.79	6.796260**	46.18915
	Maize	16872.60	543.6010	(7)	0.67	4.990433**	24.90442
	Rice	8264.890	183.6490	(8)	0.41	2.892303*	8.365417
	Red meat	3852.906	173.3762	(9)	0.96	17.00857**	289.2915
	White Meat	2605.296	213.4013	(10)	0.87	9.361292**	87.63379
The amount of imports (a thousand tons)	Wheat & flour	13107.80	1834.366	(11)	0.68	5.133364**	26.35142
	Maize	8823.217	704.4144	(12)	0.49	3.417599**	11.67998
	Rice	2673.852	175.9184	(13)	0.85	8.272842**	68.43991
	Red meat	284.6675	72.84310	(14)	0.90	10.66516**	113.7456
	White Meat	314.6682	124.0306	(15)	0.94	13.76905**	189.5867
T h e							

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	Wheat & flour	17239.09	1336.660	(16)	0.76	6.234090**	38.86387
	Maize	9879.981	458.8134	(17)	0.60	4.303008**	18.51588
	Rice	1945.000	169.4494	(18)	0.66	4.890460**	23.91660
	Red meat	313.9388	60.13178	(19)	0.90	10.82773**	117.2397
	White Meat	319.8793	114.1681	(20)	0.93	12.99520**	168.8751
Self-sufficiency %	Wheat & flour	53.01121	-0.698923	(21)	0.26	(-2.062027)	4.251957
	Maize	40.78385	-0.530703	(22)	0.32	(-2.385754)	5.691820
	Rice	75.25385	-1.111560	(23)	0.51	-3.527479**	12.44311
	Red meat	90.50187	-0.664154	(24)	0.82	-7.499527**	56.24291
	White Meat	83.20286	-1.346857	(25)	0.85	-8.236991**	67.8402

Note: * Significant at the 0.05 level, ** Significant at 0.01 level, ( ) Is not moral.

Source: Collected and calculated from (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

3.3 Food Security and Trade in The Arab Countries

Agricultural exports accounted 2% of the total exports in the Arab world in 2013. While the food exports of the agricultural export's ratio 79.2%, and the agricultural imports in the same year were the increase of 8.37% of the total imports. Food imports accounted for 83.25% of agricultural imports. The foreign trade of food commodities worth around (99.9) billion dollars in 2013, where exports contributed around (19.41) billion dollars represented about (19.44%) of the total foreign trade of food commodities, and the coverage ratio of the value of imports about (24.13%).

Figure 7; Total exports and import value In Arab countries

Source: Arab Organization for Agricultural Development. 2013. The Arab Agricultural Yearbook of Statistics, Vol. (33).

Figure 8: Food exports and import value In the Arab world

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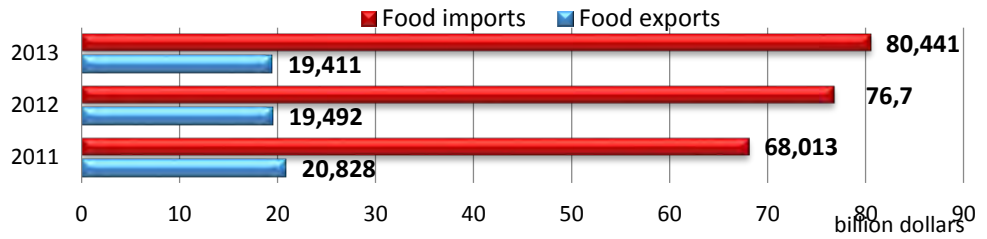
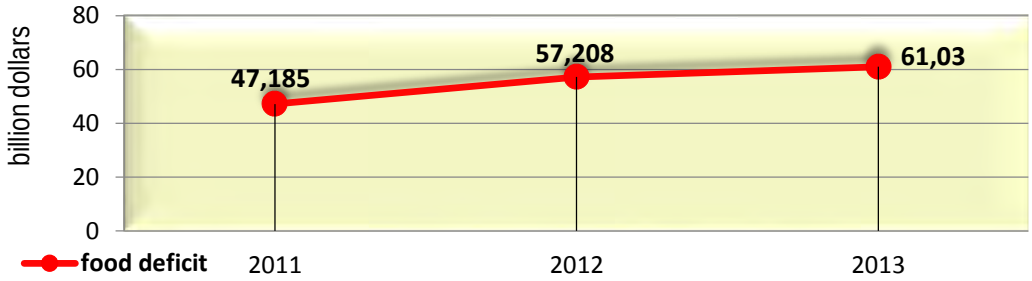


Source: Arab Organization for Agricultural Development. 2013. The Arab Agricultural Yearbook of Statistics, Vol. (33).

We can say that the reason for the growing reliance on external sources is due to a decline in the contribution of the agricultural sector in GDP and the per capita agricultural output. This has led to a shortfall in food balance, as the value of imports exceeded the value of food exports in the Arab countries, (figure 9).

Figure 9: Food Deficit in Arab countries



Note; Food Deficit = Food Exports – Food Imports

Source: Arab Organization for Agricultural Development. 2013. The Arab Agricultural Yearbook of Statistics, Vol. (33).

3.3.1 The expectation of the future quantities of food gap in Arab countries

The results in (Table 4) show that the food gap will increase due to increased demand for food commodities and the food production deficit in the Arab countries. This leads to increased food imports and exacerbated the food gap. And to alleviate the worsening gap requires the targeting of Arab economic policies to achieve the following objectives:

1 - The adoption of an integrated Arab strategy to bridge the food gap, rationalizing the consumption of food and build strategic stocks.

2- Confirmation of the Arab cooperation and integration in the field of self-sufficiency where they can do marketing activities for agricultural products in order to deepen Arab cooperation in the field of food trade.

Table 4: Future expectations for the amount of the food gap of the most important food commodities, during the years 2020, 2025 in the Arab world

Goods	The amount of the expected gap (000‘ tons)	
	2020	2025
Wheat & flour	441,504.872	551,881.09
Maize	206,775.888	258,469.86
Rice	42,288.988	52,861.235
Red Meat	7,481.4116	9,351.7645
White Meat	8,680.948	10,851.185

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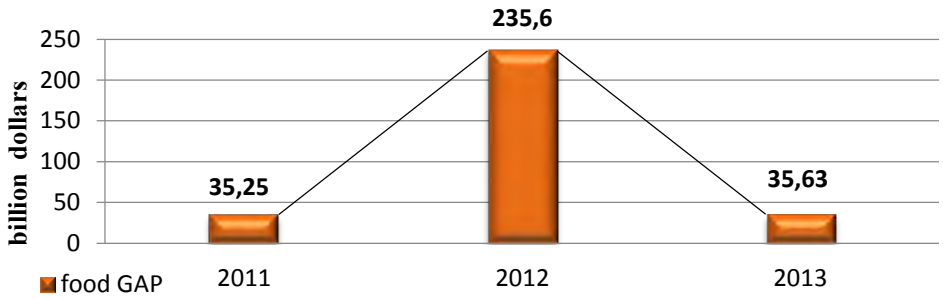
Note; Collected and calculated from the equations of the general direction of the gap amount of goods under study in Table 3.

3.3.2 Trends of The Arab Food Gap

The Arab food gap is Characterized by fluctuating from year to year due to changes in agricultural production and the volume of consumption and fluctuations in international prices of food commodities. That the value of the Arab food gap tended towards stability between 2011 and 2013, and perhaps mainly due to the efforts of Arab states to improve and increase the production of food commodities through programs and projects related to food security, Arab countries vary in the amount of their contribution to the value of the Arab food gap, according to population and consumer patterns and income levels.(AOAD 2013).

Figure 10: the value of the Arab food gap (2011- 2013)



Source: Arab Organization for Agricultural Development. 2013. The Arab Agricultural Yearbook of Statistics, Vol. (33).

Note; Food Gap = domestic production - net imports of various food commodities

3.3.2.1 The main determinants of food gap of selected commodities (2000- 2013)

From the analysis in (Table 5) we found that the local production of the wheat is the most important factor affecting the amount of the gap, where local production is unable to meet the growing demand of the population, thus leading to resort to Import and causes the expansion of the food gap. As for maize, rice that the increase in imported quantities led to the worsening of the food gap of these crops. parameters values of red and white meat show that Arab countries import quantities of meat to cover the shortfall in domestic production and meet the needs of the population, and this leads to the growing food gap of meat.

Table 5: The main determinants of the amount of the food gap of the most important food commodities in the Arab world (2000- 2013)

Goods	The estimated models	Equation	No.	(R^2)	F- test
Wheat & flour	Double logarithmic	**Log Y_1 = - 2.695952 + 0.721329 Log X_1 + 0.659054 Log X_4** **T-test** (-0.459612) (1.336604) (3.061321**)	(26)	0.85	31.52448
Maize	Double logarithmic	**LogY_2 =1.925298 – 0.564354 LogX_1 + 0.546129 Log X_2 + 0.594617 LogX_3** **T-test** (0.421642) (-1.448654) (1.407418) (4.087514**)	(27)	0.83	16.74291
Rice	Double logarithmic	**Log Y_3 = -1.726473 + 1.064644 Log X_3 + 0.170141Log X_4** **T-test** (-1.340117) (4.456173**) (0.799935)	(28)	0.85	32.89921

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Red meat	Double logarithmic	**$LogY_4 = -0.296386 + 0.075600\ LogX_2 + 0.889617\ LogX_3$** **T-test** (-0.104456) (0.298129) (14.65317**)	(29)	0.99	1319.857
White Meat	Linear	**$Y_5 = 72.55692 - 0.021889\ X_1 + 0.939755\ X_3$** **T-test** (0.918038) (-0.585658) (27.45182**)	(30)	0.91	1571.046

Note: Log; Expression of the logarithm, * Significant at the 0.05 level, ** Significant at 0.01 level, ( ) Is not moral.

Source: Collected and calculated from (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

Where;

Y_1; Gap amount of wheat and flour (a thousand tons), Y_2; Gap amount of maize (a thousand tons).

Y_3; Gap amount of rice (a thousand tons), Y_4; Gap amount of red meat (a thousand tons), Y_5; Gap amount of white meat (a thousand tons), X_1; production quantity (a thousand tons), X_2; population (million inhabitants), X_3; The amount of imports (a thousand tons), X_4; the average per capita agricultural GDP (US dollar).

3.3.3 Self-sufficiency rates of major food commodities in the Arab countries

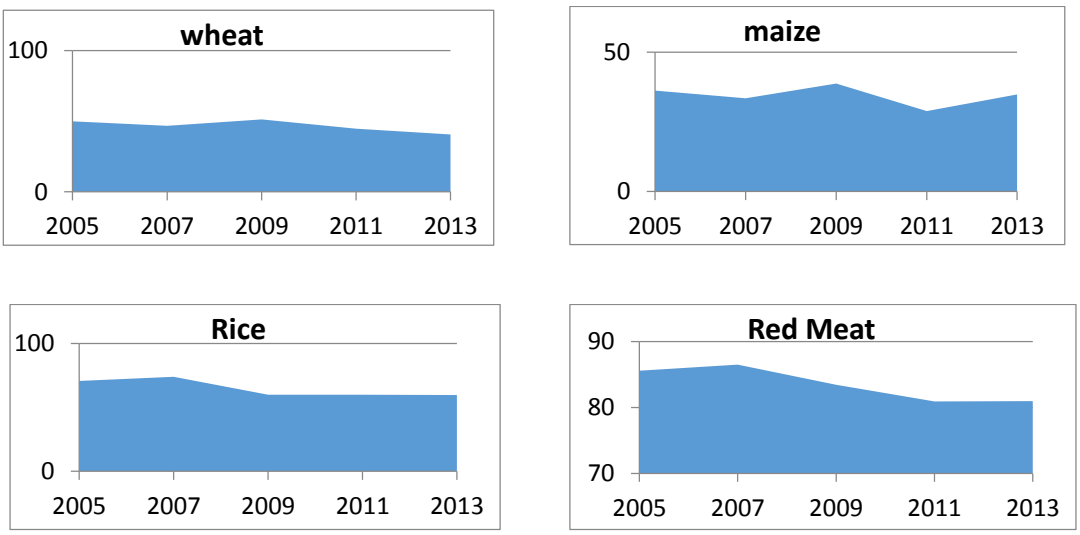
The deterioration of Self-sufficiency rates in Arab countries constitutes a threat to food security, Food commodities can be classified into three groups, according to the rates of self-sufficiency during the period 2011-2013;

1- Self-sustaining high rates of groups: its in potatoes, vegetables, fish, fruit, and eggs, where the self-sufficiency rate in excess of (96.24%).

2- Self-sufficiency rates of medium groups; include red meat, dairy products, poultry meat, and legumes where self-sufficiency rates ranging from (54.26%) and (81.09%).

3- Self-sufficiency rates are low groups; include grain, vegetable oil, sugar, ranging Self-sufficiency rates between (30.82%), (43.76%).

Figure 11: Self-sufficiency ratio of selected food commodities



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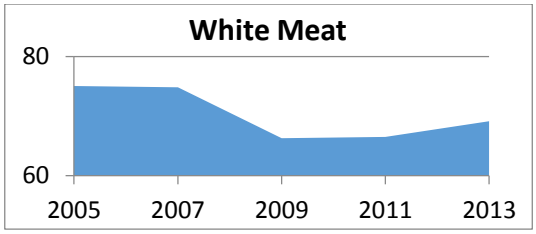

Source: Arab Organization for Agricultural Development. (2005- 2013). The Arab Agricultural Yearbook of Statistics.

3.3.3.1 The main determinants of the proportion of self-sufficiency of the selected commodities in the Arab world (2000- 2013)

The Arab countries face serious challenges in their quest to promote food self-sufficiency; including drought and limited arable land and scarce water resources, population growth, in addition to the serious implications of climate change, and to achieve food self-sufficiency in the Arab region requires a focus on regional cooperation, based on the great disparity between countries in the region on ecosystems and natural resources and income levels and consumption patterns, paving the way for a reduction of the adoption of the countries in the region on food imports, particularly cereals.

Table 6: The main determinants of the Self-sufficiency ratio of the most important food commodities in the Arab world (2000- 2013):

Goods	The estimated models	Equation	No.	(R^2)	F- test
Wheat & flour	Double logarithmic	**$LogY_6$ = 6.006015 + 0.486486 $LogX_1$ – 0.416672 $LogX_2$ - 0.313149 $LogX_4$** **T-test** (1.888573) (4.974223**) (-1,289212) (-2.653368*)	(31)	0.86	20.72322
Maize	Double logarithmic	**$LogY_7$ =2.757992 + 1.026157 $LogX_1$ - 0.375107 $LogX_2$ – 0.374225 $LogX_3$** **T-test** (0.957677) (4.176440**) (-1.532718) (-4.078820**)	(32)	0.80	14.02955
Rice	Double logarithmic	**$LogY_8$ = 4.716393 + 0.307300 $LogX_1$ – 0.333689 $LogX_3$ - 0.079488 $LogX_4$** **T-test** (6.317518) (3.977127**) (-4.399630**) (-1.146198)	(33)	0.91	31.84678
Red meat	Double logarithmic	**$LogY_9$ = 4.187218 + 0.133751 $LogX_1$ – 0.129224 $LogX_3$** **T-test** (29.58597) (6.252887**) (-20.04711**)	(34)	0.99	601.2317
White Meat	Double logarithmic	**$LogY_{10}$ = 4.060216 + 0.247023 $LogX_1$ – 0.248600 $LogX_3$** **T-test** (19.33972) (7.195546**) (-21.42376**)	(35)	0.98	446.9781

Note: Log; Expression of the logarithm, * Significant at the 0.05 level, ** Significant at 0.01 level, ( ) Is not moral.

Source: Collected and calculated from (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

Where;

Y_6; Self-sufficiency ratio of wheat and flour, Y_7; Self-sufficiency ratio of maize, Y_8; Self-sufficiency ratio of rice, Y_9; Self-sufficiency ratio of red meat, Y_{10}; Self-sufficiency ratio of white meat, X_1; production quantity (a

thousand tons), X_2; population (million inhabitants), X_3; The amount of imports (a thousand tons), X_4; the average per capita agricultural GDP (US dollar).

4 Conclusions

There are several factors that led to the limited food production in the Arab world, thus widening the food gap. In contrast. Increase demographic growth rates, The low proportion of cultivated land actually, Asymmetric distribution of agricultural resources in the Arab world, Water scarcity and misuse of disposable ones, Low agricultural productivity and the failure of agricultural policies. Domestic and foreign reports indicate that the Arab countries have the resources and experience, enough to achieve Arab food security, the requirement to take measures to protect and develop the use of those resources and to ensure the rational use and employ good arrangements. The results that have been reached in the case of Arab countries were showing that Agriculture and Food in the Arab world since the mid-seventies the situation has entered a critical stage, and was the growing demand for general food and agricultural products, in particular. As a result of high population growth rates and a qualitative jump in per-capita incomes in some Arab countries (oil), in addition to rising food prices in global markets and shrinking the relative importance of the agricultural sector in the Arab economic structures. This has resulted to worsen food shortages and therefore, resort to foreign sources to fill the deficit. So, In this the paper, we have set up methodological framework that includes estimating equations of general time trend of some food commodities during the period 2000-2013. An expectation of future quantities of the food gap of the most important food commodities, and Identify the most important factors affecting the amount of the gap and the proportion of self-sufficiency of goods under study. therefore, we can say that integration will bring significant economic advantages of the Arab world, and this calls us to work to achieve Arab economic integration and the creation of agricultural investment environment that encourages more investment in the agricultural sector and the political decision-making and administrative procedures applicable, and the diversification of Arab agricultural patterns, taking into account the principles of specialization and comparative and competitive advantages.

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APPENDIX

Appendix 1: The main determinants of the amount of the food gap and the proportion of self-sufficiency of wheat and flour in the Arab world (2000- 2013)

Years	The size of the gap (000'tons)	Self-sufficiency ratio	Production quantity (000'tons)	The amount of imports (000'tons)	The average per capita agricultural GDP (US dollar)	Population (million inhabitants)	Available for consumption (000' tons)
2000	18586.21	46	15832.7	19354.2	209	284317	34418.91
2001	24053	48.2	22375.1	2779.9	274	291469	46421.37
2002	26007.4	46.3	22461.9	27439.1	283	298528	48513.82
2003	19723.8	58.2	27457.5	20900.7	210.77	306654	47177.84
2004	22682.5	53.73	26514.7	24823.07	214.41	310371	50314.05
2005	25641.1	49.93	25571.83	27307.42	222.33	316713.9	51212.9
2006	22645.5	57.3	31264.73	23811.4	250.58	324900.8	51177.01
2007	25093.3	46.85	22939.66	27508.13	270.9	333178.7	48798.78
2008	28496.88	41.75	20427.67	29509.6	295.78	342864.7	48922.78
2009	25663.56	51.27	27098.27	26330.98	332.07	352800.7	52665.92
2010	31629.75	42.99	23847.71	32611.43	354.29	361370.2	55477.37
2011	33658	44.7	27084.01	34397	376.69	361994.1	60828
2012	37667.5	40.9	26086	38550	375.5	370442.4	63754
2013	40148	40.65	27382	40794.7	389	369859	67648

Source: (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

Appendix 2: The main determinants of the amount of the food gap and the proportion of self-sufficiency of maize in the Arab world (2000- 2013)

Years	The size of the gap (000' tons)	Self-sufficiency ratio	Production quantity (000' tons)	The amount of imports (000' tons)	The average per capita agricultural GDP (US dollar)	Population (million inhabitants)	Available for consumption (000' tons)
2000	11238.53	38.5	7035.5	11272.4	209	284317	18274.03
2001	11530.84	39.5	7528.4	11592.3	274	291469	19059.24
2002	12422.55	36.3	7079.1	12511.1	283	298528	19501.65
2003	10708.81	40.1	7169	10784.7	210.77	306654	17877.81
2004	9377.9	44.32	7463.45	9460.14	214.41	310371	16841.35
2005	14327.36	36.2	8130.41	14345.85	222.33	316713.9	22457.77
2006	12297.78	38.36	7652.36	12329.33	250.58	324900.8	19950.14
2007	14572.39	33.46	7327	14612.49	270.9	333178.7	21899.39
2008	11998.76	39.02	7678.96	12074.85	295.78	342864.7	19677.72
2009	12118.9	38.75	7666.28	12204.26	332.07	352800.7	19785.18
2010	15837.92	31.2	7181.33	15947.93	354.29	361370.2	23019.25
2011	17499.9	28.9	7110.1	17581.5	376.69	361994.1	24610
2012	16109.5	35.8	8977.5	26217	375.5	370442.4	25087
2013	16454	34.84	8800	16554.7	389	369859	25254

Source: (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

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Appendix 3: The main determinants of the amount of the food gap and the proportion of self-sufficiency of Rice in the Arab world (2000- 2013)

Years	The size of the gap (000‘ tons)	Self-sufficiency ratio	Production quantity (000‘ tons)	The amount of imports (000‘tons)	The average per capita agricultural GDP (US dollar)	Population (million inhabitants)	Available for consumption (000‘ tons)
2000	2904.89	67.8	6116.5	3460.2	209	284317	9021.39
2001	2740.91	66.2	5368.3	3056.7	274	291469	8109.21
2002	2098.04	75.2	6361.8	2869.3	283	298528	8459.84
2003	2232.22	74.1	6386.4	3023.6	210.77	306654	8618.62
2004	2473.41	73.18	6748.87	3481.34	214.41	310371	9222.28
2005	2749.01	70.62	6606.64	3558.84	222.33	316713.9	9355.65
2006	2535.91	74.14	7271.54	3576.01	250.58	324900.8	9807.45
2007	2637.17	73.8	7428.93	3945.11	270.9	333178.7	10066.1
2008	4382.4	63.64	7670.87	4808.33	295.78	342864.7	12053.27
2009	3913.32	59.87	5837.55	4676.53	332.07	352800.7	9750.87
2010	3353.01	58.4	4706.62	4844.39	354.29	361370.2	8059.63
2011	4110	59.9	6135.8	4582.2	376.69	361994.1	10245.8
2012	4367.9	60.3	6629.6	4951.2	375.5	370442.4	10997.5
2013	4524	59.69	6700	5071.6	389	369859	11224

Source: (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

Appendix 4: The main determinants of the amount of the food gap and the proportion of self-sufficiency of Red Meat in the Arab world (2000- 2013)

Years	The size of the gap (000‘ tons)	Self-sufficiency ratio	Production quantity (000‘ tons)	The amount of imports (000‘ tons)	The average per capita agricultural GDP (US dollar)	Population (million inhabitants)	Available for consumption (000‘ tons)
2000	494	87.6	3489.9	519.1	209	284317	3983.9
2001	425.23	90	3827.1	437.9	274	291469	4252.33
2002	489.17	88.9	3917.8	507.6	283	298528	4406.97
2003	555.38	88.2	4151.2	583.7	210.77	306654	4706.58
2004	558.79	87.63	3956.7	588.06	214.41	310371	4515.49
2005	698.99	85.59	4153.2	719.87	222.33	316713.9	4852.19
2006	721.89	85.44	4235.09	759.54	250.58	324900.8	4956.98
2007	696.11	86.48	4453	739.82	270.9	333178.7	5149.11
2008	662	87.59	4674.55	701.15	295.78	342864.7	5336.55
2009	990.48	83.42	4983.46	1081.91	332.07	352800.7	5973.94
2010	978.24	83.2	4843.81	1071.72	354.29	361370.2	5822.05
2011	1146.1	80.9	4866	1237.9	376.69	361994.1	6012.1
2012	1119.2	81.4	4901	1293.1	375.5	370442.4	6020.2
2013	1173.4	80.94	4983.4	1392.5	389	369859	6156.8

Source: (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

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Appendix 5: The main determinants of the amount of the food gap and the proportion of self-sufficiency of White Meat in the Arab world (2000- 2013)

Years	The size of the gap (000‘ tons)	Self-sufficiency ratio	Production quantity (000‘tons)	The amount of imports (000‘ tons)	The average per capita agricultural GDP (US dollar)	Population (million inhabitants)	Available for consumption (000‘ tons)
2000	471.42	83.6	2403.1	497.3	209	284317	2874.52
2001	653.89	80.2	2648.6	675.1	274	291469	3302.49
2002	702.02	80.7	2935.4	726.4	283	298528	3637.42
2003	872.41	75.3	2659.6	912.5	210.77	306654	3532.01
2004	840.15	77.43	2882.16	874.1	214.41	310371	3722.31
2005	975.06	75.09	2939.64	1013.13	222.33	316713.9	3914.7
2006	875.61	74.61	2573.47	925.76	250.58	324900.8	3449.08
2007	944.43	74.85	2811.3	996.79	270.9	333178.7	3755.73
2008	1405.59	67.02	2855.98	1488.25	295.78	342864.7	4261.57
2009	1516.27	66.31	2983.79	1637.07	332.07	352800.7	4500.06
2010	1609.31	66.88	3250.19	1727.17	354.29	361370.2	4859.5
2011	1815.2	66.5	3602.8	1894	376.69	361994.1	5418
2012	1925	65.8	3705.3	1995.2	375.5	370442.4	5630.3
2013	1859.6	69.13	4164	2065.8	389	369859	6023.6

Source: (AOAD) Arab Organization for Agricultural Development. (2000-2013). Yearbook of agricultural statistics, the Arab League, various issues.

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Efficiency and productivity of the Slovak agricultural investment support beneficiaries

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Abstract
In this paper we estimate the effects of the farm investment support provided under the Rural Development Program (RDP) on efficiency and productivity of the Slovak farms. We used panel data of 631 Slovak farms over 2007-2013 RDP SR programming period. The overall effects of investment support on farm efficiency and productivity we estimated by non-parametric method Data Envelopment Analysis (DEA), using output-oriented CCR and BCC models. Total factor productivity changes were estimated by Malmquist indices and their decomposition. We found, that productivity of both beneficiaries and non-beneficiaries of the investment support slightly decreased over time. This decline could be mostly attributed to technological regression. On average, the farms, non-beneficiaries of investment support, were more technically efficient than beneficiaries. Investment support however, enabled beneficiaries specialised on crop production significantly improve their performance towards the best farms. The investment support provided under the RDP should be more targeted towards smaller farms with low capital endowment.

Keywords: *farm investment support, productivity, efficiency, DEA, TFP*

JEL Classification: *C61, O32, Q12*

1. Introduction

Farm investment support is one of the EU Rural Development Programme policy instruments provided to enhance farm productivity, agricultural production efficiency and thus farm competitiveness. Investment to new technologies could lead to efficiency growth and improvement of farm position on the market.

There are growing number of empirical studies on farm investment support impact and farm productivity and efficiency. The most methods used for impact assessment, including the Data Envelopment Analysis (DEA) methodology compare before and post treatment effects or effects with and without treatment (beneficiaries, non-beneficiaries of the support). The shortcoming of such an approach is in the assessment of a total, instead of a net effect of the treatment.

Difficulties of estimation of farm investment support effects on farm efficiency and productivity in EU Member States discussed **Bergschmidt et al. (2006), Coelli et al. (2006) Bergschmidt (2009); Forstner et al. (2009); Bernini a Pellegrini, 2011; Michalek (2012)** and other more descriptive evaluation reports. **Beck and Dogot (2006)** assessed investment support impact on farm income of dairy farms in Valonia and proposed the investment support impact indicators. They found that in the short run there were no connections between investment and farm income growth. Investments however, had positive long run effect on the farm competitiveness and sustainability. **Garbarino and Holland (2009)** applied the qualitative and quantitative methods for assessing the impacts of investment support at farm level. **Gallerani et al. (2008), Viaggi et al. (2011)** analysed farm investment behaviour. They applied mixed methods, using case studies of selected countries, complemented by the

positive programming modelling. Qualitative aspects, socio-economic factors and incentives of farm investment behaviour were examined by **Olsen and Lund (2011). Buysse et al. (2011)** evaluated the impact of farm investment support in Flanders. They found that the investment support of agricultural diversification increased overall production and income. Analysis of technical efficiency and overall TFP productivity in the Czech agriculture conducted **Cechura (2012)** with the Fixed Management Model. The most important factors that determined the Czech farm technical efficiency and TFP were those associated with institutional and economic changes, in particular a growth of subsidies and dramatic increase of meat imports. **Spicka and Machek (2015)** analysed investment activity and investment subsidies allocation in specialized milk farm efficiency change in 100 EU regions over the period 2007 to 2011. They found that investment subsidies per livestock unit are slightly higher in the regions with a negative change in the production efficiency and continuously helped them to mitigate the drop in technical efficiency.

In recent studies the net effects of a policy are estimated using counterfactual approach. **Pufahl and Weiss (2009)** estimated agro-environmental and LFA measures impact on farms in Germany. **Ortner (2012)** assessed the net effects of farm investment support in Austria and found that due to its positive effect on Gross Value Added, investment support rendered private investments profitable. **Wigier et al. (2014)** analysed the investment support impact on Hungarian and Polish farm economic performance. **Kirchweger and Kantelhardt (2014), Kirchweger et al. (2015)** analysed the effects of farm investment policy on structural changes of the Austrian farms. Investing farms significantly enlarge and intensify their production. **Ciaian et al. (2015)** estimated the extent to which farm investment is substituted by investment support policies granted under the EU Rural Development Programme (RDP). They found crowding-out effect of the RDP close to 100%, implying that farms use public support to substitute for private investments.

Investment support effects on farm performance in the Central European region of the EU investigated several authors. According to **Ferto et al. (2012)** subsidized producers can invest in farm development and achieve higher technical progress since they are less credit constrained. **Ratinger et al. (2014)** analysed factors of the Czech farm participation in investment support scheme. They found significant positive effects of the investment support on gross value added and improvement of labour productivity. **Pechrova (2015)** assessed the impact of subsidies from the 2007–2013 RDP of the Czech Republic on efficiency of Czech agricultural holdings and found statistically significant differences between beneficiaries and non-beneficiaries. **Henning and Michalek (2008)** applied econometric approach and PSM approach for assessment of the SAPARD impact on the Slovak farm performance. Similar study was performed by **Božik et al. (2013).** They concluded that investment in farms with strong capital endowment would be realized even without investment support.

Taking into account deficiencies of applied methods and availability of data, the main objective of this paper is to investigate productivity and efficiency of the Slovak farms beneficiaries of the CAP farm investment support provided under 2007-2013 Rural Development Program (RDP). We expect farm productivity and efficiency growth in the period 2007-2013, despite of a negative effect of global crisis. Significant positive change of efficiency and productivity is anticipated in farms, beneficiaries of investment support and those beneficiaries specialised on crop production.

2. Data and Methods

We estimated the overall effects of investment support on productivity and efficiency change. Farm productive efficiency was estimated using Data envelopment analysis (DEA) a

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nonparametric method, the output-oriented models, under assumption of constant return to scale (CRS) CCR model (**Charnes, Cooper, and Rhodes, 1978)** and variable return to scale (VRS) BCC model (**Banker, Charnes, and Cooper, 1984).**

Performance of the farms we expressed by total factor productivity (TFP) approach. As an estimator for the TFP change we applied output oriented Malmquist index, which employs **Shephard's (1970)** output oriented distance functions. We follow **Färe et al. (1994)** procedure Eq. 1 and Eq.2.

$$M_0(x^t, y^t, x^{t+1}, y^{t+1}) = \frac{D_o^{t+1}(x^{t+1}, y^{t+1})}{D_o^t(x^t, y^t)} \cdot \left[\frac{D_o^t(x^{t+1}, y^{t+1})}{D_o^{t+1}(x^{t+1}, y^{t+1})} \cdot \frac{D_o^t(x^t, y^t)}{D_o^{t+1}(x^t, y^t)} \right]$$
$$= TECH(x^t, y^t, x^{t+1}, y^{t+1}) \cdot TCH(x^t, y^t, x^{t+1}, y^{t+1})$$
$$TECH(x^t, y^t, x^{t+1}, y^{t+1}) = \left[\frac{D_o^t(x^t, y^t | VRS)}{D_o^t(x^t, y^t | CRS)} \cdot \frac{D_o^{t++}(x^{t+1}, y^{t+1} | CRS)}{D_o^{t+1}(x^{t+1}, y^{t+1} | VRS)} \right] \cdot \left[\frac{D_o^{t+1}(x^{t+1}, y^{t+1} | VRS}{D_o^t(x^t, y^t | VRS} \right] \quad (2)$$
$$= SECH(x^t, y^t, x^{t+1}, y^{t+1}) \cdot PECH(x^t, y^t, x^{t+1}, y^{t+1})$$

where: M_0 Malmquist TFP index is defined as the geometric mean of two Malmquist indexes for two adjacent periods, which can be decomposed to technical efficiency change (TECH) and technological change (TCH). Malmquist index is based on the assumption that technology exhibits constant returns to scale (CRS).

If the assumption on returns to scale is relaxed to allow variable returns to scale (VRS), then component of TECH, following **Färe et al. (1994)**, can be further decomposed to scale efficiency change (SECH) and pure efficiency change (PECH). To examine differences between average productivity change of the beneficiaries and non-beneficiary farms, we employ Mann-Whitney U-Test. Software DEAP **(CEPA, 2011)** was used to estimate the measures of technical efficiency and productivity.

We constructed fully balanced panel of farm yearly data **(IL MoARD SR, 2014)** from 2007 to 2013 of 631 farms; with average utilised agricultural area (UAA) 1375 ha; 42 annual work units (AWU) and 592 livestock units (LU). Five input variables were used in our study: costs of material and energy inputs and other costs in EUR; the annual work units (AWU), assets in EUR, utilized agricultural area. Two outputs variables were selected: revenues from the sale of own products and services and other revenues.

3. Results and Discussion

Productivity growth may be achieved through technical change and efficiency improvement. Technical change refers to the change in technology which results in an upward shift of the production frontier. Efficiency improvement refers to more efficient use of various resources under current technology. In the period 2007-2013, the highest average technical efficiency (TE CRS) reached farms with mixed production, non-beneficiaries of investment support (Tab.1). Generally, non-beneficiary farms attained higher average technical efficiency compare to beneficiaries. The results indicate technical efficiency gain of livestock farms, both beneficiaries and non-beneficiaries of investment support (Tab. 1).

To examine differences between average productivity change of the beneficiaries and non-beneficiary farms in 2007-2013, we employ Mann-Whitney U-Test with the null hypotheses that the performances of beneficiaries and non-beneficiaries are the same.

Over 2007-2013, the highest enhancement of average productivity exhibited farms with mixed production, non-beneficiaries (Tab. 2). The average productivity fall down in both crop

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and livestock production specialised farms, regardless of investment support presence. A drop of average productivity was smaller however in farms specialised on crop production.

In the 2007 to 2013 period we observed moderate productivity decline by approximately 0.7% per year (Tab. 3). Decomposition of productivity change allowed us to identify weakness of farm productivity development. Technical efficiency of all but crop production specialised farms, went up (TECH). This improvement however, had on average very small effect on productivity change. The highest technical efficiency improvement (TECH) was observed in livestock farms, non-beneficiaries of the investment support, followed by farms with mixed production, non-beneficiaries (Tab. 3). It seems that the farm investment support in that period was mainly used to cope with strong competition in a short time.

Tab. 1 Average technical efficiency (TE CRS) of farms, 2007-2013

Farm investment support	*Specialisation*	*Number of farms*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Beneficiaries	CP	122	0.684	0.620	0.588	0.638	0.638	0.744	0.675
	LP	127	0.645	0.624	0.540	0.600	0.645	0.697	*0.664
	MP	71	0.681	0.661	0.569	0.619	**0.637	*0.728	0.682
	Average	320	0.668	0.631	0.565	0.619	**0.641	0.722	0.672
Non-beneficiaries	CP	162	0.705	0.652	0.623	0.689	0.675	0.769	0.692
	LP	97	0.648	0.665	0.535	0.614	0.660	0.710	*0.719
	MP	52	0.710	0.708	0.640	0.711	**0.732	*0.787	0.746
	Average	311	0.688	0.665	0.598	0.669	**0.680	0.753	0.709
Average in panel		631	0.678	0.648	0.581	0.644	0.660	0.738	0.690

Notes: CP - crop production; LP- livestock production; MP - mixed production; CRS - constant returns to scale; *0.1 significance level, **0.05 significance level, 0.01 significance level between beneficiaries and non-beneficiaries.
Source: own estimation

Over 2007-2013 period, we observed on average significant technological regress, significant increase of managerial efficiency and decrease of scale efficiency. Managerial efficiency (PECH) one component of a technical efficiency change (TECH) of all farm groups increased over time and shows increasing ability of decision-making units to convert farm inputs into outputs. Managerial efficiency change captures changes in efficiency regarding the variable returns-to-scale (VRS) technology.

The second component of technical efficiency change (TECH) is a technological change (TCH) which refers to shift of the best practice frontier capturing innovations. This shift is affected by adoption of new agricultural technologies or innovations, like high yielding varieties and by a change in the economic policies or environmental and other regulations. Livestock farm adjustment to the EU common market conditions required increased investments for restructuring, introduction of new production technologies, adjustment to the EU production standards and hygiene conditions. Over the seven-year time period, the highest technological progress was gained by crop farms, regardless of investment support. Farms specialised on livestock exhibited significant technological regress. More detail investigation of investment behaviour and prevailing investment activities could discover prevailing regulatory investment by these farms. Farm technological regress significantly affected development of their productivity.

The third component of technical efficiency change, the scale efficiency change (SECH), reached on average values close to 1 and suggests that in general most of the farms are operating close to the right scales. Especially the farms specialised on livestock production,

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both beneficiaries and non-beneficiaries could significant improve their technical efficiency by changing their operational scale.

Tab. 2 Yearly and cumulative change of TFP (2007-2013)

Farm investment support	*Specialization*	2008/ 2007	2009/ 2008	2010/ 2009	2011/ 2010	2012/ 2011	2013 /2012	*Cumulative change 2013*
Beneficiaries	CP	**0.983	0.898	1.071	1.109	0.965	0.980	0.992
	LP	0.988	0.948	1.020	1.009	0.961	0.976	0.904
	MP	1.023	0.891	1.040	1.048	0.964	0.988	0.946
Non-beneficiaries	CP	**0.965	0.915	1.092	1.109	0.971	0.956	0.993
	LP	1.018	0.901	1.027	1.032	0.953	0.993	0.919
	MP	0.987	0.995	1.058	0.935	1.024	1.013	1.007
GEOMEAN		0.989	0.917	1.055	1.060	0.967	0.977	0.957

Notes: TFP - total factor productivity change (Malmquist index), CP - crop production, LP - livestock production, MP - mixed production; *0.1 significance level, **0.05 significance level, 0.01 significance level between beneficiaries and non-beneficiaries.
Source: own estimation

Tab. 3 Average values of total factor productivity components (2007-2013)

Farm investment support	Specialisation	TFP	TECH	TCH	PECH	SECH
Beneficiaries	CP	0.999	0.997	1.002	1.002	0.996
	LP	0.983	**1.005	***0.979	**1.013	*0.992
	MP	0.991	1.000	0.991	1.005	0.995
	Average	0.991	1.001	0.990	1.007	0.994
Non-beneficiaries	CP	0.999	0.997	1.002	1.000	0.997
	LP	0.987	**1.018	***0.970	**1.024	*0.994
	MP	0.995	1.008	0.987	1.011	0.997
	Average	0.995	1.005	0.990	1.009	0.996
Geom. Mean		0.993	1.003	0.990	1.008	0.995

Notes: TFP - total factor productivity, TECH – technical efficiency change, TCH-technological change, PECH – pure technical efficiency change, SECH – scale efficiency, CP – crop production, LP – livestock production, MP – mixed production; *0.1 significance level, **0.05 significance level, 0.01 significance level between beneficiaries and non-beneficiaries.
Source: own estimation

There was no significant effect of the investment support on farm productivity improvement. On average, the overall productivity of beneficiaries of investment support fall down mainly due to technological regress. The only exemption was a group of farms specialised on crop production, achieving technological progress. Higher technological improvement exhibited on average, beneficiaries of the investment support.

4. Conclusion

We analysed productivity and efficiency of the Slovak farms, beneficiaries and non-beneficiaries of the investment support provided under the 2007-2013 RDP SR. The average productivity fall down in both crop and livestock production specialised farms, regardless of investment support presence. Similarly **Nowak et al. (2015)** found low technical efficiency of the Slovak agriculture in 2010 compare to other EU MS. A drop of average productivity was smaller however in farms specialised on crop production. Technical efficiency of all but crop production specialised farms, went up (TECH). Farms in observed period preferred catch-up strategy. The highest enhancement of average productivity exhibited farms with mixed

production, non-beneficiaries. A decline of average farm productivity of all but crop farms was mainly caused technological regress, regardless of investment support presence. Better targeting of the investment support is therefore very important. The least efficient farms were those specialised on crop production, on the other side they achieved technological progress. Similar results are also found in study of Austrian farms (**Kirchweger et al. 2015**) where farms participating in the Austrian farm investment program increase their production significantly more than the non-beneficiary farms.

The average operational scale of the farms also affected farm productivity development. Its change is the most desirable in farms specialised in livestock production. Managerial efficiency of all farm groups increased over time and shows increasing ability of decision-making units to convert farm inputs into outputs. The results and conclusions of empirical studies estimating the effects of the investment support on farm productivity and efficiency differ. We found that investment support contributed to technological improvement only in crop specialised farms. Farms beneficiaries of investment support were able to moderate decline of their technical efficiency and they shift closer towards the best farms. Similar development was observed in the Czech Republic by **Spicka and Machek (2015).** Capital investment did not have effect on the productivity growth of Dutch arable farms **(Zhengfei and Oude Lansink, 2006)**. The investment support did not show any significant influence on the TE for example of the Swedish farms **(Manevska-Tasevska et al., 2013)**, due to its poor targeting. This study also pointed out, that investment support of regulatory investment generates positive externalities which could be underestimated and have no direct effects on farm output. Regulatory investment carried out by the Slovak farms beneficiaries of the investment support can explain a part of their productivity and efficiency development in 2007-2013.

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Leadership models in European retail industry

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Abstract
Leadership models and management have always been up-to-date in retail enterprises in Europe and have a high level of significance. This paper shows the seven most popular leadership models with their characteristics and details. Moreover further leadership models and theories are presented. The research questions are: Which of these seven main approaches are the most appropriate theories for the retail industry? Or is it not possible to find a final answer which applies generally? Furthermore it is shown which kind of models are up-to-date and what types of classical leadership models still have been used successfully, partially with adaptations. Hereby, during the discussion of results, some possible ways are shown, where the world of leadership models in the European retail trade could move.

Keywords: *leadership, leadership models, retail industry, Europe*

JEL Classification: *F23, M12, M16*

1. Introduction (First-level heading, Times New Roman 12pt, Bold)

The European Retail Branch is one of the largest economic sectors of the EU-28. This results from earned turnovers of over 2.4 trillion euro p.a. and a number of employees of approximately 17 million. Furthermore, thinking of food and textiles, retail is certainly necessary for the distribution of 507 million people. Hereby the range runs from the vitally important until luxury and the adornment of life. The domestic market, created by the EU-28 countries, is measured in terms of BIP (GDP) the largest single market in the world. Five of the ten largest EU-28 retailers are German enterprises. In the TOP 10 worldwide Germany is represented with three companies. In this situation the authors took the advantage to use a direct access to the first and second level of the large retail trade companies. For the first time this probably enables a survey among top deciders of the leadership models in their particular enterprises. For comparison, besides the academic discussion, large and very large retail companies, all of them international and always operating in several European countries (a significant quantity of these is operating globally) were utilized. Hereby the company structure, stock company or other types had no significance. Whereas it is to state the fact that the majority of the large European retail trader of all branches either directly or indirectly are dominated by family entrepreneurs majoritarian since their founding, often over decades. In contrast to other industries a rather unusual situation. This particular owner situation has also influence on the human leadership, company's culture and values of an enterprise.

In this work a comparison of the leadership models in the European retail trade is made and described, how these 17 million employees are led by the respective managers. Hereby different kinds of models are described, compared and analyzed in an expert questionnaire with regard to their positive suitability and distribution. Thereby it can be mentioned in this introduction yet that without anticipating the research result, a "one size fits all" leadership model is difficult to identify. In this work the leadership models of all relevant branches of retail trade like food, textile, DIY, drugstore, furniture and interior design, shoes and leisure are compared and

described. So conclusions can be drawn regarding the theoretical state of research and the implementation in companies. However one circumstance is obvious at all current studies, developments of models and all discussions: the human leadership plays an outstanding role for a long-term business success. But how to develop and create practical new leadership models? This discussion has been continued for decades and with no end in sight. A proverb in trade says <Handel ist Wandel> (trade is change). A similar thing happens with leadership models, whereas not few constants are available and maintained, especially considering the background of a fast and comprehensive modified working and customer environment. The contribution of this work should give a current state of the situation and also a first outlook for the future.

We also contribute to the growing literature on CEO style. Several studies find evidence of managerial fixed effects on a variety of corporate outcomes (Weisbach, 1995; Chevalier & Ellison, 1999; Bertrand & Schoar, 2003; Bennedsen et al., 2006; Frank & Goyal, 2007). We address a more focused questions, asking which CEO style is most commonly used in European retail industry and which is the most suitable one.

1.1 Literature review

Leadership is generally described as an interpersonal process in which a leader influences followers. In most definitions, the basic elements of leadership usually include a leader, a follower, and their relational interactions (Dansereau et al., 2013). Recent research has expanded the original theories (Bird, 1940; Mann, 1959; Stogdill, 1950) by placing greater emphasis on how and why followers are willing to be influenced by their leaders (e.g., Podsakoff, et al., 1990; Rousseau et al., 1998; Van Knippenberg et al., 2004). One factor that seems to influence the leader–follower relationship and is relatively universal to leadership theories is trust (Dirks & Ferrin, 2002). Another important factor usually connected with leadership is ethics (Bauman, 2013). Including discussions of ethics and morality when developing a leadership theory, however, is usually unquestioned. What leadership research must do is seek to understand the values behind moral integrity and leadership without moving to a value-free social science (Ciulla, 2004). Linking leadership with morality is a consistent theme in modern leadership theories. An excellent overview of leadership ethics and leadership theories is provided by Brown and Trevino (2006). Theory and research concerning leadership, especially in the organizational context, suggest that leadership is an important factor that may affect work team processes and results (Chen & Kanfer, 2006; Kozlowski & Ilgen, 2006; Mathieu et al., 2008; Morgeson et al,, 2010; Randall et al., 2011). Therefore, the leadership training becomes a necessity (Santos et al., 2015).

The literature on the topic leadership models is very extensive in general, in many aspects controversial and it tries to connect the mega trends in the future with a success-promising leadership ideology. Therefore leadership faces the always same old and above all new challenges, because the mega trends influence the world of leadership models (Ernste et al., 2014). The social megatrends of the today's world are demographic change, globalization, individualization and structural change and technology. In addition to these mega-trends, the developments concerning leading people in general have to be expounded. So, the intelligence and power of intuition is emphasized actually more and more strongly, this also in connection with the term of company culture. Therefore the managers, and hereby the real leaders are meant, determine the silent rules in a company. If these managers want to lead rather formally or integratively, etc. this reflects intuitively again. These rules, independently of the official leadership models, help employees to feel quickly familiar with different kinds of company's cultures (Gigerenzer, 2008).

In the paper for the retail trade relevant actual leadership models are compared and analysed (table 1).

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Table 1: Comparison of the leadership models

	Model 1 Harzburger Model	Model 2 GRID	Model 3 St. Gallen	Model 4 Situational Management	Model 5 New Leadership	Model 6 No Management
Approach to problems	voluntary simplicity	depends on employee and task orientation	a general organization grid is used	different situations and edge conditions require situational leading styles	the anticipation and the acting in context of changes	the leadership behaviour is derived exclusively from situations and the acting persons
Leading Model Described	leading instruction, substitutions, target agreements are described	team management, instruction management, association management, paternalism, survival management, human organization management, opportunism	enterprise model, leading model, organization model	suitable leadership style is defined by a work-related and psychological maturity of the led person	innovation, support of engagement, empowerment of led person are important	no defined or communicated or living leading model
Further Development	model`s instruments are being modernized	further developed under the term "Synercube"	developed in different directions (the most important school for the European retail trade is based on Fredmund Malik and his approach)	being constantly developed further	the emotional leadership moves forward to the top priority ranking	a possibility to a conflict-free leadership
Main Features	delegation of responsibility; interventions only in case of imminent danger; explicit job descriptions and general internal instructions were created	the connection between the led person and the leading person plays a major role	enterprises are no more described as static organizations; basic conditions are created and they rely on the company's own dynamism	providing open spaces, challenging tasks, learning opportunities against a confidential and good cooperation and a respectful work environment	"power" plays a minor role,	leading behavior is only situational, changes often

Source: own processing

2. Data and Methods

2.1 Data

The method of questioning was selected for the collection of statistical data as well as data referring the different kinds of leadership models in order to be able to find out the preferences and opinions of the questioned persons. In the survey 25 experts were asked. According to a research for this work, it is the first time that such a large number of top managers of European retail trade were ready for a survey about leadership models. These 25 experts managed in their professional current situation or their carrier numerous middle- and large retail companies or concerns or even belong as a participant to their company. The led companies come from all retail branches like food, furniture, shoes, textile, interior design, ware houses, drug stores, construction markets, office trader, garden center and beverage markets.

All business types in retail trade like full-line supplier, discounter and specialist supplier were included. All experts work or worked for international European companies. The companies always operate in several countries of the EU, some in more than 20 countries. Also all company types are represented, from the limited company, the stock company, to the joint partnerships as well as mixed forms as the limited by shares.

The managed companies have a turnover in total of >100 billion euros p.a. and occupy more than 400.000 employees. In European retail trade majoritarian from three countries the large systems were developed, from France and UK, but mostly from the German speaking area (DACH-region), especially discounter of all assortments. Mainly entrepreneurs and top managers of the DACH-region get a chance to speak in the expert's questionnaire. This is due to the market importance of trade companies from the DACH-region for Europe and the direct personal access to this group of people, what was the basic condition to be able to make this survey. From the top 100 retailers in Germany in 2013, 25 companies are included in this survey. Referring to the top ten, seven are included. Furthermore we would like to point out that three from the worldwide ten largest food retailers were included in our survey for the European section. These companies also operate internationally in Europe, without exception.

Regarding this survey it is particularly necessary to point out that six from the 25 surveyed persons are real company founders, majority shareholders or persons who enjoy a similar status like an entrepreneur, due to their development work in their respective companies and their status within their families, enterprises and foundations. All other surveyed experts are to be found in the executive board or managing board, thus in the first management and leadership level respectively the first level of the entire HR segment. Some of them are or were members of further advisory boards of retail companies.

The large majority of the middle management or even the lower management or employees and workers in retail trade were not explicitly asked in this survey. Certainly, a large number of questionaries' could have been evaluated statistically. But, by asking the top management and the owner level, the strategic background of leadership models and theories could rather be examined and this always top-down, regarded from the peak. Also interesting hereby is how far an implementation is technically realized and really successfully implemented in reality.

2.1 Methods

The programs Statistical Package of the Social Sciences 22 (SPSS 22) and Microsoft Excel 2007 were used for the input, processing of the data, as well as statistical evaluation of the collected data. Various statistical procedures were used for the examination of the derived hypotheses. On the one hand the chi-squared test for independency was used for the mathematical response of the individual questioning, in other cases the linear single regression with a categorical predictor variable. The choice of the particular procedure is adapted respectively to the optimally possible scale level, which was possible according to the available data. In the case of too small survey samples regarding some questions, it was decided not to calculate these with SPSS. However the results were analyzed descriptively and displayed graphically.

For all calculations exclusively two-side test methods were made, as the available hypotheses were formulated undirected. The small survey sample size complicated the achievement of the significance level; at the same time the survey sample size is – relatively considered – not all that small, as there is only a very limited number of top managers available in the area of European retail trade.

3. Results and Discussion

3.1 Prominence of the Leadership Models

Referring to question number seven, the first substantive question, a matching with the analysis of the literature review regarding the topic of the prominence of the seven leadership models should be done by means of the expert's questionnaire. A very interesting point is the different

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perspective referring to the various age groups, which are shown in the table 2. So, <Situational Leadership Model> and <New Leadership Model> are more well-known than the other models among younger managers between the age of 23 and 49. Only concerning <No Leadership Model> all age groups correspond rather identically. The real difference is that the older managers in the age over 49 state that they are particularly familiar with the <Harzburger Model> as well as <GRID Model>. This corresponds to the chronological development of the different models from the Fifties of the last century to the present time.

Table 1 then consistently shows that independent on the number of employees, the <Situational Leadership Model> shows the highest recognition in organizations with more than 20.000 employees. Followed by different forms <Harzburger Model> over <GRID Model> and <New Leadership Model> up to <St.Gallen Model> and <No Leadership Model>.

Table 2: Prominence of leadership models (ordered)

	Age			Size of Company	
	less than 23	**23-49**	**over 49**	**500-5000**	**over 5000**
Harzburger	2.	3.	1.	2.	2.
GRID	3.	4.	2.	4.	3.
St. Gallen	5.	5.-6.	6.	5.	5.-6.
Situational Leadership	1.	1.	3.	1.	1.
New Leadership	4.	2.	4.	3.	4.
No leadership model	6.	5.-6.	5.	6.	5.-6.

Source: own processing

It is worth mentioning that a number of experts added the following: The <Anthroposophic Approach>, as practiced by the drug store operator dm or the national LEH operator Tegut with its headquarter in Fulda/Germany, gains more and more followers, in particular in the increasing market segment BIO-LEH. Experts stated several times that the particular leadership style which corresponded to the development status of the organization, particularly of the employees, would be realized. Additionally they acknowledged positive leadership (power orientated leadership) as well as the styles authoritarian and patriarchy.

3.2 Practibility of the Leadership Models

The experts rate the practicability of <Harzburger Model> as highest, closely followed by <Situational Leadership Model> and <GRID Model>, directly behind are <New Leadership Model> and finally <St. Gallen Model> and <No Leadership Model>. At <Others> anthroposophical, authoritarian and patriarchy style were mentioned as before. This is further illustrated in the following table 3. The special emphasis of the practicability of the <Harzburger Model> certainly also lies in its long-term and wide spread implementation. It shows the contrast between the Top Management/owner level and the level of division managers. The division manager considers <New Leadership Model> as superior practicable and <No Leadership Model> as rather impractical. Here it seems to be more obvious which models are seen more or less practicable. Especially in the largest companies with more than 5000 employees, the <Situational Leadership Model> and the <New Leadership Model> stands for practicability and the <No Leadership Model> is not preferred at this point.

Also the age obviously plays a larger role referring to the evaluation of practicability. So the younger experts below the age of 49 consider the <Situational Leadership Model> and the <New Leadership Model> more suitable. However the manager older than 49 has a greater faith in the implementation quality of <GRID Model> than of <Harzburger Model>. This also depends on the respective life and work experience.

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Table 3: Practibility of leadership models (ordered)

	Age		Size of Company	Hierarchy	
	23-49	**over 49**	**500-5000**	**company head, member of board, general manager**	**division manager**
Harzburger	3.	2.	3.	1.	4.-5.
GRID	5.	1.	4.	3.	4.-5.
St. Gallen	4.	4.-5.	5.	5.	3.
Situational Leadership	1.	3.	1.	2.	2.
New Leadership	2.	4.-5.	2.	4.	1.
No leadership model	6.	6.	6.	6.	6.

Source: own processing

3.3 The Use of Leadership Models in the European Retail Trade

Table 4 shows significant differences, if you disconnect the hierarchy levels. Owner and General Manager see <Situational Model> and <Harzburger Model> at the same level and also (still) point out <St. Gallen Model>. The Division managers however have a clear preference for the <Situational Model>, followed by <Harzburger Model> and <No Leadership Model>. Table 3 also shows that younger Managers up to the age of 49 years recognize the use of the <Harzburger Model>, followed by <New Leadership Model> and <Situational Leadership Model>, far behind <GRID Model>, <St. Gallen Model> and <No Leadership Model>. The manager above the age of 49 has another perception. Here the <Situational Model> is ahead of <Harzburg Model> and <GRID Model>. This assessment corresponds with the comparison of the expert's opinion of the large employers with more than 20.000 employees.

Table 4: Use of leadership models in the European Retail trade (ordered)

	Age		Size of Company	Hierarchy	
	23-49	over 49	over 5000	company head, member of board, general manager	division manager
Harzburger	1	2.	2.	1.-2.	2.-3.
GRID	4.-5.	3.	3.	3.	4.-5.
St. Gallen	4.-5.	6.	6.	5.	6.
Situational Leadership	2.-3.	1.	1.	1.-2.	1.
New Leadership	2.-3.	5.	4.-5.	4.	4.-5.
No leadership model	6.	4.	4.-5.	6.	2.-3.

Source: own processing

There were recognized mixed forms of <Harzburger Model> and <GRID Model>, as well as <Harzburger Model> in combination with aspects of <Situational Leadership Model>. Almost a third of the experts mentioned this mixed model, so that we could assume an extensive circulation in practice. There are additionally mentioned <GRID Model> and <Situational Leadership Model> per single message, <Authoritarian-Harzburger Model>, <Chaotic-Situational Model>, <GRID-Situational Model> <Malik School-St. Gallen Model> and <Positive Leadership Model>, <Situational Leadership Model> and <New Leadership Model>, <Harzburger Model> and <No Leadership Model>, <Situational Model – New Leadership Model>, <Delegation (Harzburger) Model – Authoritarian Model>, <Situational Model –

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Chaotic Model>, <GRID Model –Authoritarian Model>, <Harzburger Model- Patriarchy Model>, <GRID Model – Patriarchy Model> and <Situational Model – Patriarchy Model>. To summarize, a colorful mixture of all possible combinations.

In the literature review there has already been mentioned the fact of the frequently occurring mixed forms. This is due to the fact that most of the examined enterprises act in different geographies associated with large cultural differences, as for example Scandinavia and Eastern Europe. This will be considered by the companies, despite or because of an international strategy, by means of adaptions on the respective leading culture of the countries.

3.4 The Most Frequently Used Leadership Models in the European Retail Trade

Table 5 deals with the questions about the reasons for the high, low, or non-implementation of the various leadership models. The top managers rank <Situational Management Model> on first position and <St. Gallen Model> has not been mentioned. Managers, with the age older than 49, show an almost equal response behaviour. <Situational Model> at front place, however equally followed by <Harzburger Model> and <No Leadership Model>, again no mention of <St. Gallen Model>. In middle size companies up to 5000 employees we find a relatively uniform distribution, only without <New Leadership Model> and <St. Gallen Model>. In those companies with more than 5000 employees all models, except <St. Gallen Model>, are used. <Situational Model> and <Harzburger Model> are ranked on top.

Table 5: The most frequently used leadership models in the European Retail trade

	Age	Size of Company		Hierarchy	
	over 49	500-5000	over 5000	company head, member of board, general manager	division manager
Harzburger	2.-3.	1.-4.	2.	2.	1.-2.
GRID	4.	1.-4.	4.	4.	3.-4.
St. Gallen	6.	5.-6.	6.	6.	5.-6.
Situational Leadership	1.	1.-4.	1.	1.	1.-2.
New Leadership	5.	5.-6.	5.	5.	5.-6.
No leadership model	2.-3.	1.-4.	3.	3.	3.-4.

Source: own processing

Referring to question concerning the frequency of the use of the seven leadership models a contradiction becomes obvious. Within the scientific discussion and referring to the prominence in the questionnaire the <St. Gallen Model> takes an established place. In the operational praxis none of the top managers sees relevant reasons for an effective use of this model. This could be related to the fact that the <St. Gallen Leadership Model> is seen as too complex in retail trade and a continuous implementation is described as elaborating. In the Top management of European Retail trade <St. Gallen Model> is well-known, but a significant implementation in enterprises is neither existing nor probable in future.

3.5 Further results

Referring to the personal preferences of the success promising future leadership, following models were added: <Situational Leadership Model>, if it is seen sufficiently broad, including the different cultures in the individual countries and the mixed form <Situational Model – New Leadership Model>. The General Manager clearly prefers the mixed form. Long-term top Managers rely on <Situational Model> and (surprising) <GRID Model>. The experienced

manager with 10-20 years of experience builds on a mixed form, <New Leadership Model>, others and <GRID Model> as well as <Harzburger Model>.

Referring to the question regarding the best chances for success in the future it is clearly stated by the very international traders with more than eight countries that the <New Leadership Model> is favored, followed by the <Situational Leadership Model> at the same level with the mixed forms. Obviously in case of great international scope the well-known and traditional leadership models <Harzburger Model> and <GRID Model> are left behind.

3.6 Discussion

In the article the seven most well-known and, without the <St. Gallen Model>, the most common leadership models in the European retail trade were described and compared in their individual parts. In this context the three already long existing and researched approaches, <Harzburger Model>, <GRID Model> and <St. Gallen Model>, were viewed regarding their characteristics and their practical implementation. The clear result hereby is that <Harzburger Model> is still used in different adaptions and after modernizations, just as the <GRID Model>, rarer, but still with a high importance in retail. However the third and well-known model of F. Malik respectively the University of St. Gallen, has a surprising high prominence and in relation to this a very low range of implementation, at least in European retail trade. The delimitation to the two classical models, <Harzburger Model> and <GRID Model>, which were and are mainly used in European trade, clearly indicates that once again the St. Gallen team is aware of the fact that for various reasons their model is hard to deal with in retail trade.

The New Leadership model is human-related and aims at the delegation of responsibility, a confidential working atmosphere and a reduction of hierarchical structures. This all complies with the modern spirit of the age of the following digital generations and especially offers an option for a decentralized and fast decision finding for the retail trade, with its many geographically spread units. These are essential as the basic conditions for a fast and profitable grow. In addition to this come the mutation and the polarization between the more and more digitalized retail trade, very large branch systems and a respective regionalization of trade formats, starting with the food trade, even in large discount concerns. Therefore a prediction can already be made, that this kind of leadership models will find their way and take over a very important part.

Also surprising was that the <No Management model>, a contradiction in itself, is used more often in practice than supposed. The reasons for that continue to lie in darkness. What affects company managements and owners to waive any, although first of all only theoretical announcement of a leadership model? Are these future intentions or the simple understanding that it also obviously works without any? Or is it the aversion of companies and managers to take over models from the theory into practice, which is always accompanied with risks, work and the use of resources? Leadership definitely also takes place in companies without any defined leadership model. Furthermore these companies existed and exist with a long lasting presence, often with significant material success. Maybe this model is the best of all? Interesting and broad questions appear for a further examination of the theme complex “Leadership models in European retail trade”.

3.7 Limitations

The performed limitation to larger companies and the respective stationary sector is simply due to the size, complexity and the variety of the branch. A presentation of all distribution types, from the one-person business for all retail formats, size classes, partial branches and distribution channels would not have been possible in a reasonable scope of this paper.

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Additionally it has to be mentioned that the output, questionnaires and results mainly come from LEH Europe and are not equally spread over all sub-sectors. On the one hand, this is due to the significant dominance of the LEH-segment in relation to other Non-Food branches in European retail trade and, on the other hand, regarding the expert's questionnaire, the direct access especially to the management of these companies. Derived from this, the paper does not describe all 28 EU-countries from an equal perspective, but on many parts, by means of the perspective and through the eyes of the German speaking countries Germany and Austria. This circumstance just plays a roll concerning the company cultural differences because the respective parts of Europe sometimes differ strongly at this point, even though the leadership models have the same name.

Finally remains the relatively small number of participants concerning the expert's questionnaire, which is due to the fact that from 130 potential persons, 25 experts participated. In absolute terms a quite moderate number of persons but on the basis of the function level, the number of managers at this level and mainly the number of viewed companies is a high rate, as quasi all experts have worked in different companies in their career. Additionally it has to be mentioned that the experts have occupied supervisory board mandates in other European retail companies. Thus 50% of the large stationary retail companies of Europe (Top 100) are covered. So, such a large group of experts has not been asked about leadership models in European retail trade in this way so far. This is certainly also a decisive contribution of this paper to the discussion concerning this topic.

4. Conclusion

In the recent history many enterprises rely on the proven models as the Harzburger model or GRID. The actual development, pushed by the social megatrends and the dramatically changing conditions with regard to the increasing digitalization and globalization, clearly goes in the direction of New Leadership and situational leadership and in mixed forms or modernizations of proven models. The (European) retail trade – world became too complex and fast moving, in order to do everything right with one leadership model "one size fits all" and to be able to cover everything.

In the paper also the following insight could be gained. Extreme gaps partly exist between the academic discussion about leadership models and their implementation in companies and the company's reality. The large-scale expert's survey plus interviews of top-managers respectively companies of reputable European companies confirmed this gap in large part. In this work many companies of the top 100 in European retail trade, including the market leaders, had the chance to speak. Gap means how far the often theoretical discussion in its supposed precision is away from the real life. Thereby the expert's survey could answer some research questions, f.e. about prominence and implementation of leadership models. Other assumptions, as f.e. the application of St. Gallen model, were clearly disproved. New additions include findings beyond the actual scientific discussion, f.e. the gap of the countless companies and organizations that seem to manage without any official leadership model. Surely one quintessence is that in the daily business countless mixed forms and adaptions exist, which are due to the different company- and country cultures.

With regard to the human leadership it is not about the technical patents and physical legitimacy. Leadership always is something deeply social, an interaction between people and therefore very difficult to transform into theoretical concepts. Each leader and led person, each group in companies and many frame conditions are different and are managed differently. This is scientifically insufficient, but the reality.

Indeed, since the beginning of chain store trade there has been human leadership and it will also exist in future, both at the stationary trade and also – changed – in digital multi-channel trade. The research in this entire topic will also be continued.

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Agriculture and economic development in Uzbekistan

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Abstract
Uzbekistan is one of the fastest growing economies in the world. Structural changes have been occurring during the last two decades since its independence in 1991. In this paper we analyze the structure of the economy of Uzbekistan to measure the influence of agricultural sector on it. By reviewing the dynamic changes in agricultural development in Uzbekistan for the last 20 years, including share of agriculture in GDP, population, employment in agriculture, etc., we argue that growth in agricultural productivity is central to development, a message that also appears prominently in the traditional development literature.

Key words: *agriculture, GDP growth, structure of the economy, Uzbekistan*

JEL Classification: *Q01, O11, O13*

1. Introduction

With its favorable climatic conditions for crop production, agriculture has long been considered one of the priority areas of the economy of Uzbekistan. Currently, this sector accounts for around 30% of employment and 18% GDP. As is typical of economies dependent on agriculture, Uzbekistan has low income per capita: $5,316 compared with $2,227 for neighboring Kazakhstan or $25,635 for Russia (PPP equivalents, 2014 data from World Development Indicators). Such relatively low income and the high agrarian profile justify and drive the efforts for deeper understanding the role of agriculture.

2. Literature review

Developing economies have generally been described as dual economies with a traditional agricultural sector and a modern capitalist sector; and productivity is assumed to be lower in agriculture than in the modern sector. The canonical model was put forward by Lewis (1954) and subsequently extended by Ranis and Fei (1961). Lewis' model rests on the idea of surplus labor in the agricultural sector. With lower productivity in agriculture, wages will be higher in the modern sector, which induces labor to move from agriculture to the modern sector, which in turn generates economic growth.

Other precursors, such as Schultz (1964), also point out the importance of food supply by the agricultural sector. In Schultz's view, agriculture is important for economic growth in the sense that it guarantees subsistence for society, without which growth is not possible. This early view on the role of agriculture in economics matched Kuznets' (1966) empirical observation that the importance of the agricultural sector declines with economic development. In this view, the role of agriculture in economic development is to supply cheap food and low wage labor to the modern sector. Otherwise, both sectors have few

interconnections. Growth and higher productivity in the agricultural sector can contribute to overall economic growth by releasing labor as well as capital to other sectors in the economy.

Building on the Lewis model, Johnston and Mellor (1961) account explicitly for agriculture as an active sector in the economy. In addition to providing labor and food supply, agriculture plays an active role in economic growth through production and consumption linkages. For instance, agriculture can provide raw materials to nonagricultural production or demand inputs from the modern sector. On the consumption side, higher productivity in agriculture can increase the income of the rural population, thereby creating demand for domestically produced industrial output. Moreover, agricultural goods can be exported to earn foreign exchange in order to import capital goods.

The importance of such linkages was further stressed by Singer (1979) and explicitly embodied in Adelman's general equilibrium idea of "agricultural demand-led industrialization" (ADLI), according to which, because of production and consumption linkages, a country's development strategy should be agriculture-driven rather than export-driven and increased agricultural productivity would be the initiator of industrialization. Moreover, emphasis should be placed on small-to-medium-size farmers because they are more likely to use domestically produced intermediate goods, as opposed to large scaleproducers who might import machinery and other inputs, which would weaken the linkages between agriculture and other sectors (Adelman, 1984).

On the other hand, Matsuyama (1992) suggests that the relation between agricultural growth and overall economic growth depends on the openness of a country to international trade. Whereas agricultural growth goes hand in hand with economic growth in small, closed economies—where gains in agricultural productivity will lead to the linkage effect described above—the relation might be reversed in the case of an open economy. If the country has a comparative advantage in agriculture, openness to trade will draw resources away from the modern sector into agriculture, which might be less productive than industry.

Thus, there is a vast literature, ranging from critical contributions that do not support "agriculture first" approaches to more recent "agro-pessimism" views. The latter are based on the observation that agriculture in developing countries might be the least productive sector in the economy. Dercon (2009) derives this conclusion from a two-sector model elaborated by Eswaran and Kotwal (1993). He explains that, in an open economy, in which both agricultural and modern-sector goods can be traded, linkages between the two sectors become less important for overall growth. As a result, there is less necessity to increase agricultural productivity to induce overall growth.

However, although various theoretical models suggest opposing roles for agriculture in development, they do not necessarily contradict each other. The models are derived under different economic assumptions (e.g., openness to trade). Therefore, it is not surprising that they derive different policy implications. For instance, World Development Report (World Bank, 2007), which suggests that in agriculture-based economies, agriculture can be the main engine of growth, whereas in transforming countries, agriculture is already less important as an economic activity but still a major instrument to reduce rural poverty. In urban countries, by contrast, agriculture plays the same role as other tradable sectors and subsectors with a comparative advantage and can help to generate economic growth.

So far our discussion has mostly considered theoretical models. We now turn to empirical investigations of the relation between the agricultural sector and economic growth. Timmer (2002) uses a panel of 65 developing countries over 1960–1985 to show a positive correlation between growth in agricultural GDP and its lagged values and nonagricultural GDP growth. He suggests that this correlation can be explained by ''first-order'' effects of agricultural

growth on lower food prices, labor migration, and capital flows from agriculture, as well as ‘‘second order’’

effects, such as improved nutritional intake, which improves workers’ productivity. Similarly, Self and Grabowski (2007) establish a positive relation between different measures of agricultural productivity and average growth of real GDP per capita over 1960–1995 for a cross-section of countries. However, on the basis of panel data from 52 developing countries during 1980–2001, Gardner (2005) concludes that agriculture does not seem to be a primary force behind growth in national GDP per capita.

Although these empirical investigations establish a correlation between agriculture and GDP growth, they do not imply causation in either direction. The correlation observed could be spurious if both sectors have been growing independently of each other or as a result of a common third factor. As a result, some authors criticize studies that argue that there is a causal effect of agricultural growth on economic growth. To address this issue of endogeneity in empirical work, Tiffin and Irz (2006) use Granger causality tests to establish that agricultural value added per worker has a positive effect on GDP per capita in developing countries. Bravo-Ortega and Lederman (2005) employ panel data tools, such as GMM and Granger causality tests, to re-estimate the effect of agricultural growth on the overall growth rate. Using 1960–2000 panel data, they find that an increase in agricultural GDP raises nonagricultural GDP in developing countries, whereas a reverse relation exists for developed countries.

3. Data and Methodology

How to value the contribution Agriculture for Economic growth? Via our method and data analysis we will see the relative contribution between agriculture for development in Uzbekistan. We observe share of agriculture in GDP, annual growth in this sector to find contribution for economic development in Uzbekistan. We use the comparative analysis to find out the coefficient between agriculture and economic development. Although this method will be checked through descriptive statistics analysis.

Economic development in Uzbekistan during the years of development

Uzbekistan is one of the fastest growing economies in the world. In the past 11 years, including the current 2015, the growth rate of gross domestic product is stable stored at more than 8 per cent, provided the balance of macroeconomic indicators, a stable surplus of the State budget and balance of payments, the growth of exports and foreign exchange reserves, while the public external debt not more than 18.5 per cent of GDP. [1]

Another important driving factor behind economic growth is external demand. [2] During the years of independence (1991-2014) years GDP increased by 4.5 times, while exports grew by 4 times. The growth of exports was facilitated primarily by increasing the exports of non-commodity goods and products with high value-added (i.e., cars and transportation services), which in turn allowed for a current account surplus.

The main driving factors of the economic growth were the high rates of economic activity which have been largely explained by liberalization to foreign economic activity and faster development of export capacity, large-scale investments into the economy, and gradual improvement of its composition.

Despite the global economic crisis, the economy grew by almost 6 times the real per capita income increased by more than 9 times. In just the past 5 years in the economy sent about 67 billion dollars, more than 21 percent of them - it is foreign investment.

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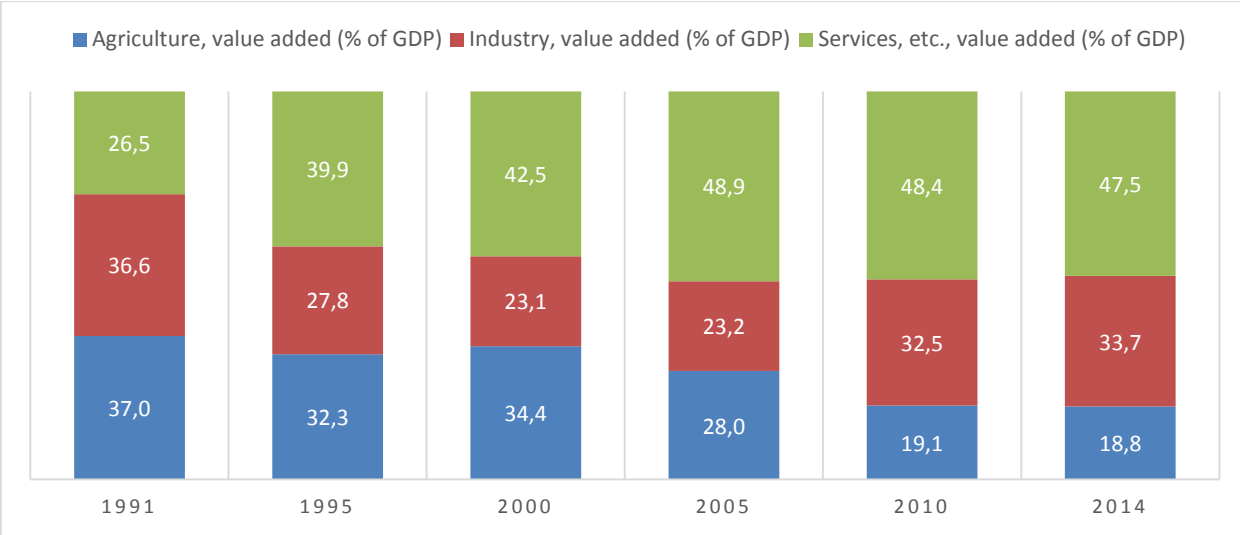
The continuation of the new investments boom is directly related to the modernization and technical overhaul of the companies, modernization of fixed assets according to the targeted programs for development of the sectors of the economy, construction of industrial infrastructure and social facilities.

If we look to structure of GDP of Uzbekistan, so far agricultural sector was dominating in the sphere of real production in Uzbekistan. However, due to implementation of structural reforms during 1991-2014, the share of agricultural sector in GDP declined from 37% to 18% while the share of service increased from 26% to 47%. Industry is fluctuating during 1991-2010 due to macroeconomic policy, but it remains around 33% (Figure 1).

Figure 1. Share of sectors in GDP of Uzbekistan



Source: World Development Indicators 2015

Uzbekistan is one of the major countries in the region producing agricultural products. The existing potential provides Uzbekistan with the first place in agricultural production in Central Asia. Particularly, leadership of the country in gross collection of fruits and vegetables is clearly marked: its share in total volume of fruits collection makes about 4/5 of total production in the region.

During the short period of independent development, a major reforms are implemented in Uzbekistan, allowing to almost entirely diversify agricultural sector and provide population with main food crops, as well as establish large volumes of their export.

GDP in Uzbekistan as well as the production volume of agricultural products is increasing year by year in a stable manner as a result of economic reforms being carried out by the government.

Since 1997, our agriculture demonstrates steady positive growth of 6-7% annually. Starting 1991, the volume of agricultural production has more than doubled, allowing to increase per capita consumption of meat by 1,3 times, milk and dairy products – 1,6 times, potatoes – 7 times, vegetables – more than 2 times, fruits – almost by 4 times. Currently, over 17 million tons of fruits and vegetables are produced in the country annually, constituting 300 kg of vegetables, 75 kg of potatoes and 44 kg of grapes. These figures are roughly three times higher than the average consumption rates. [4]

The comprehensive measures helping to steadily increase the export potential of the industry. In recent years, Uzbekistan has become a major exporter of high quality and competitive fruit

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and vegetable products. In order to ensure year-round supply, a significant attention to the processing and storage is devoted. Over the past 10 years, the volume of processing of vegetables and grapes increased by 3.5 times, including the canned fruits and vegetables by 2.5 times, dried fruits – 4 times, natural juices – 7 times. More than 16% of total production of vegetables and grapes are processed. Currently, more than 180 types of fresh and processed fruit and vegetable products are exported. Its share in the structure of exports is 73%. [4]

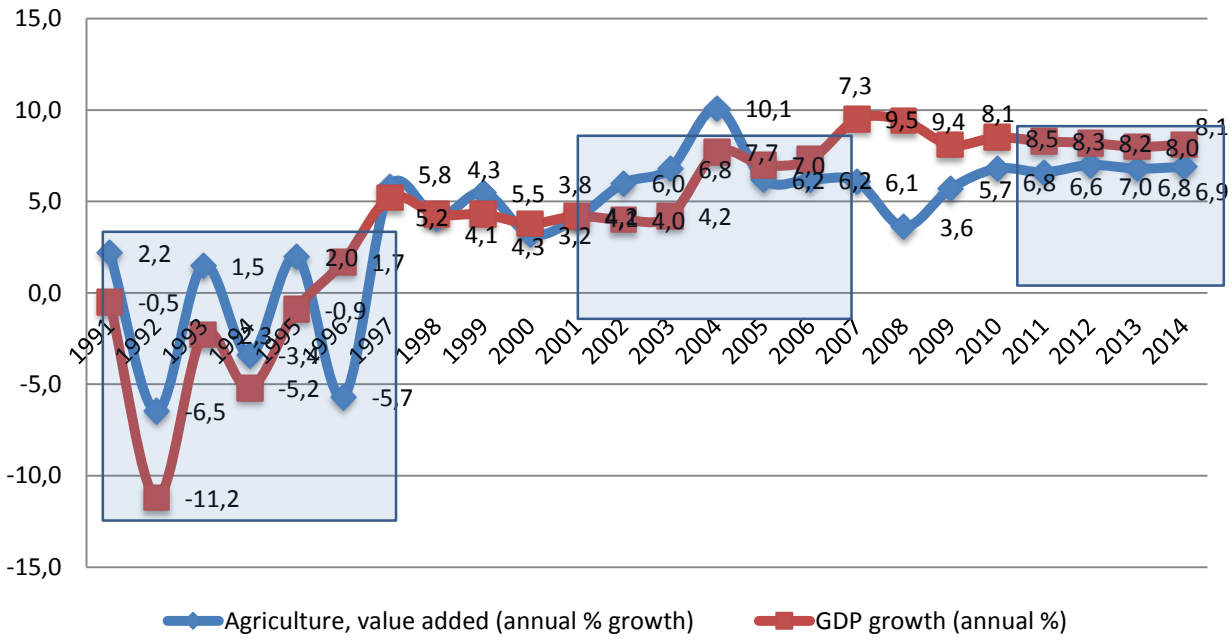
The geography of horticulture and viticulture exports is also expanding. Previously Uzbekistan traditionally supplied Russia, Kazakhstan and other CIS countries, whereas now it exports to the markets of more than 120 countries worldwide, including Indonesia, Norway, Mongolia, Saudi Arabia, Slovakia, the USA, Thailand and Japan.

Agricultural development in Uzbekistan

Uzbekistan has been an agrarian country, with its rural population at more than 60% and agriculture accounting for around 30% in employment and 18% in GDP (World Bank, 2013). As is typical of economies, dependent on agriculture. [5]

In terms of developments over time, the share of agriculture in GDP has declining from 36% to 18% since 1991, showing a definite downward trend during the last twenty four years although the Agriculture GDP in 2014 is 2.11 times as much as the data in 1991 because the GDP grows 4.5 times sine year 1991. It was meaning, the remaining sectors, such as: industry, service increase much faster than Agriculture, and the country is going industrialization.

Figure 3. Agricultural and GDP growth in Uzbekistan.



Source: World Bank 2015

If you see chart, there are close relationship between GDP growth and agricultural added value in Uzbekistan.

From 1991 to 1997 GDP growth was depended to Agriculture. During this time agricultural growth and GDP fluctuated between -11 to 5% growth annually.

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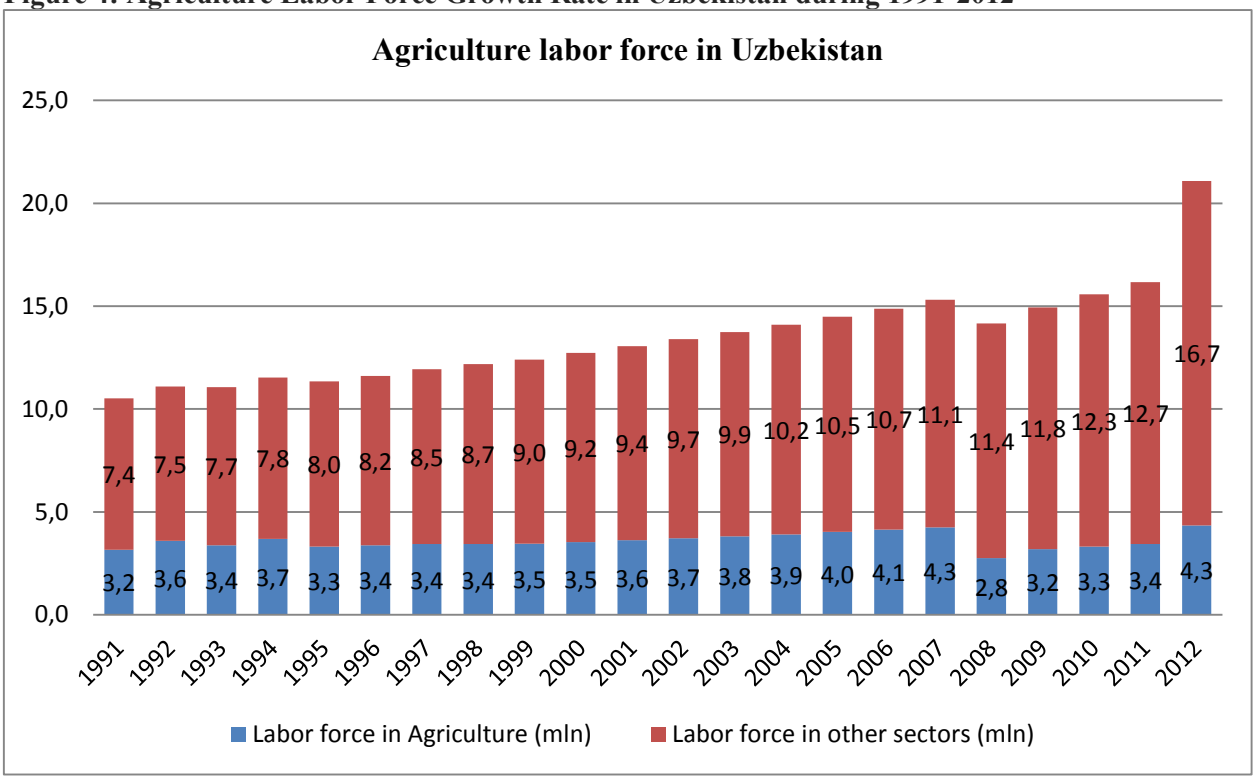
Even simple coefficient of correlation also shows a very high relationship between growth rates of GDP and agriculture. During years 1991 to 2014 correlation index of GDP and agriculture growth was 0,82.

The share of rural population, shown in Figure 4, is steadily increasing over time due to higher population growth rates in rural areas from a constant 60% up to 1990 to 64% in 2004-2006.

The share of agricultural employment also remained steady at 40% up to 1990, but after a slight increase to 44% in the beginning years of transition (1991-1993) the trend changed to a downward slide. The share of agriculture in total employment had dropped to 25.8% by 2012 (curve, green line below). Usually, agricultural employment keeps steady around 40%, but the situation changes from 2008, and the opposing trends sharply dropping down from 38% to 27% in 2009. In the past a few years, the number is slightly decreasing.

On the other hand, the total number of employment in Uzbekistan is raising stable from 1991 to 2007, then in 2008 the total number of employee in Uzbekistan dropped down 1.5 Million since the number of agriculture employee came down.

Figure 4: Agriculture Labor Force Growth Rate in Uzbekistan during 1991-2012



Source: World Bank/CIA

During 2008 and 2012, agriculture employee rising quickly from 2.75 million to 4.34 million, but the percentage of agriculture employee descend from 27% to 25.9% because the employee in the other sector is ascending much faster than agriculture labor force.

From Figure 4, we can see that there are 3 phases of the growth rate trend of Labor force in Agriculture. The first phase from 1991 to 1996, the labor force growth rate is fluctuate from 10% in 1991 to 14% in 1992, then -6% in 1993, 9% in 1994,-10% again in 1996. The first phase from 1997 to 2007, the growth rate of labor force in Agriculture is quite stable around 3%. The third phase from 2008 to 2012, the labor force growth rate fall down from 3% in 1997 to -35% in 2008, then bounce back to 13% in 2009. In year 2010 and 2012, the number keep 4%, but in year 2012, it is increased to 26%.

At the same time, there are a number of problems in the agricultural sector requires its system solutions in the country. For example, there is imbalance in the production, distribution, storage, purchase of agricultural products, including those for public use, and that in general, tend to reduce the efficiency of agricultural production and reduce the profitability of farmers and agricultural producers.

According to estimates of national experts from the total annual grown fruits and vegetables in the country of about 25-30% (more than 1 mln. Tons annually) lost to waste and do not reach the customer. The long chain of intermediaries and dealers to the end user, reducing profit margins of farmers and dekhkan farms, and in general, their cost-effectiveness.

Until now an urgent need to improve agricultural productivity, processing, reduction of losses from spoilage at the stage of production and sale to the final consumer. In this regard, it should be noted a number of important government decisions, including the government program for the construction of vegetable stores and industrial refrigerators in the country. However, the available power outages reduce the profitability and efficiency of their programs, as well as the safety of products.

A particularly important issue, for which annually draws attention to the Government is to increase employment in rural areas through the creation of new jobs, additional handling and processing, storage of horticultural products, the expansion of services. Consistently improved welfare of farmers and rural residents by diversifying production, growing more crops more efficient that leads to higher yields of agricultural producers of the country. In this direction, there are some positive results, which should be strengthened and further developed.

The most acute problem of agriculture is the overall technical and technological lag in updating the fixed assets and technological equipment, poor implementation of information and communication technologies in the industry.

Conclusion

For a number of agricultural issues notes the complexity of the distribution and implementation of national and international scientific developments in farming, and in general agriculture. And the increase of economic efficiency of agricultural production and depends on many factors, in particular the access to new technologies and equipment of agricultural production, training, knowledge, skills, strengthen information flows, etc.

Acknowledgements

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Impact of attention driven investments on agricultural commodity prices

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Abstract
This paper investigates the causality between attention driven investments, traded volumes and the final price of agricultural commodities. Agricultural commodity price levels are created by the traditional merchants at the agricultural sector and by the speculative investors. We are focusing on the speculative investments driven by news related to the future commodity price movements. In comparison to the history, nowadays the relevant information are in majority spread by World Wide Web. It depends just on the traders which media they find reliable for their investments. In our case we are measuring the interest of the traders for investments to the agricultural commodities based on the number of keywords searched by Google's search engine.

Key words: *agricultural commodities, attention, investments, risk*

JEL Classification: *G11, G15, G23.*

1. Introduction

Historically the agricultural commodities prices were created by natural supply of commodities by producers and demand from the processors of the commodities. Future contract to trade the commodities were used just to protect the farmers or producers from the unpredictable rising or decreasing of the commodity prices. Agricultural commodity price levels were moving due to the grown volumes of each crops over the year and over the season.
Nowadays the financial market and commodity market are linked by each other much tighter. Disturbances on one market affect the price levels on another markets and vice versa.

Traders at the financial market can place their capital to the government bonds, currency pairs, stocks of the companies or into the financial funds associating more companies.
Investors can trade at the spot markets for current prices or at the futures markets for future prices. All of this wide range of investing possibilities is useless in the period of recession, when the financial markets are falling. In general stocks values are decreasing and companies do not payout the dividends. Consequently values of the financial indexes are decreasing as well. The level of interest at which the stable countries borrowing capital is so low, that in some cases the are attacking negative values. The way out of this situation for traders who like to make profit from their capital or at lest don't miss their money is investing to the commodities.

Very famous investment commodities are precious metals like gold, silver and platinum. During the financial crisis between the years 2008 and 2009 investments to the precious metals dramatically increased. In 2007 total physical gold investment was 438 metric tons and silver investment was 1605 metric ton. In the next year investments to the gold more than doubled to the 913 metric tons and investments to the silver exploded to the 5826 metric tons. During one year 2009 the prices of gold increased by 24% (Carlson, 2014).

Speculative investments to the agricultural commodities are not that generally known, as investments to the precious metals nevertheless in recent years are very common. From 2005

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till mid of the year 2008 the prices of food commodities doubled in real terms. The major increase were observed by soybeans + 86%, wheat +101%, maize + 102%, rice + 110% and palm oil + 140% (Gilbert, 2008).

It is clear that commodity investments are attractive scope for traders. Our goal is to find out based on what traders makes the decisions where to invest their capital. By our hypothesis in large extent their decisions are made according to the information about the predictions of future financial derivatives and commodity prices.

Information sources are far more extensive then they were in the past. In the past investors were taking actions based on the information from the TV, radio and newspapers (Mondria, WU, Zhang, 2009). Impact measurement of that information to the behavior of traders was virtually impossible. Nowadays people receiving most information from the Web by search engines. According to this knowledge we will use for our measurement of attention driven investments Google search engine, specifically its analytical tool "Google Trends" web page. Google Trends summarize all the searched words through Google from January 2004. Our objective is to find interconnection between number of searched keywords attached to the specific agricultural commodities and their price level movements and traded volumes of that commodity.

1.1. Attention driven investments

Theoretical studies show that there are many triggers, which lead traders from financial market to invest into agricultural commodities. Investors are buying commodities due to their price stability to make their investment portfolio more robust and resistant from financial market volatility. Investments that do not aim to purchase commodities physically are speculative investments. Investors from financial market do not want to own the agricultural commodities, they just want to make profit from price movements on the market and subsequently before the contracts expire they sell the commodities to the merchants from the agricultural sector.

Financial speculations:
Commercial speculations have been used since the 19th century to protect commodity buyers and sellers against price movements. Buyers at agricultural sectors are protecting against sudden price increases and sellers against sudden price falls. For those merchants are speculations a form of insurance. Gilbret (2009) explains that companies like agricultural cooperatives, sugar refinery, grain elevator companies or farmers are typical commercials. They operate with a small margin between sales and purchase prices, with the consequence that a small decrease of their products prices can eliminate profits on their inventories. To offset this price exposure they are selling futures contracts (short positions) and speculators on the other side buy those contracts with the expectations or hope that the prices will appreciate what will yield them the capital gain.

According to the U.S. Commodity Futures Trading Commission (2012) speculative investment is similar to hedging, but the objective is not to buy or sell real assets, while just making profit from the successful participation of price level movements.

Attention driven speculations:
Traders have wide spectrum of information channels by which information flows to them. Investing into the agricultural commodities based on the news about predictions of commodity price movements or based on the information about estimated size of the harvest is speculative investment.

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By O'Hara (1995) markets allow traders to trade based on their information. In theory of finance we distinguish between informed and uninformed traders. Information about price movements may arise from research or knowledge of the market. In situation, when on the market are not many informed traders, they have an opportunity to make profit on their information, but when most of the traders are well informed, price of the information become inbounded in the market price.

Many investors have a problem with searching the right commodities to buy. Usually they are not searching the investment opportunities systematically, rather they consider to purchase just the stocks that first catch their attention. This effect causes that capital flow to stocks and other financial derivatives that are more attention grabbing. Selling process is affected by attention grabbing effect less, while individual investors own in general just a small number of stocks or financial derivatives and they are selling just stocks they have (Barber and Odean 2008). In reality investors are heavily influenced by news from the media. This attention-based trading leads investors to buy or sell too speculatively and in many cases information from have potential to shape the price levels of financial derivatives.

According to Barber and Odean (2011) in the fast changing world investors have many opportunities to reach the information but just a limited amount of attention what they can devote to trading. To reach the advantage from the acquired information investors have just a limited time to make their trading decisions. Investors' behaviour is affected by attention in two ways. In the first case they devote little attention to the information (that is some times important) and in the other case they spend a lot of attention to information (that is some times irrelevant), which can lead to an overreaction.

In many cases investors are influenced by information from the entire environment around them, mostly by their vicinity and working place. They tend to invest to the stocks of companies where they are employed or to companies in their surrounding area (Kazantstev 2013).

Efficient market theoreticians led by Krugmann (2008) argues, that commodities prices rise is driven just by market supply and demand and information of the trades is always incorporated in the market price, meaning that speculators cannot make extra profit on their information.

From the professional perspective we can analyse impact of the information much deeper. According to Kazantstev (2013) news analytics refers to the quantitative analysis of news streams, what means to run procedural steps to turn the information to the time-series and quantitative metrics. Application of news analytics is used for the qualitative impact evaluation of events that have been previously ignored. Practical perspective is their utilization for creating new trading strategies and application set on the capability to plot the behaviour of the companies over time.

2. Data and methodology determination: Estimation dependence between information and agricultural commodity prices

We are treating news from Internet as a main source of the information according which investors making decisions where to place their capital. By Sterling (2015) the most popular search engine is Google with 65% followed by Bing from Microsoft (20,4%) and Yahoo (12,7%). Based on the information from World development indicator (The World Bank, 2015) number of Internet users from a whole world perspective rise from 17% in 2006 to 42% in 2014 and the number of internet users in developed countries is in general over 70%. Nowadays an important issue not access to the Web, but the information reliability of the

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Web sites. For that reason we have chosen for survey Google, it is most widely used with reliable information and its Trends database counts number of searches.

3. Results and discussion

Based on the current study we did not observed significant correlation between number of searches by Google and spot commodity price changes. In the next step we have to calculate the correlation between the number of searches and prices in the time differences. As an example we show the time series of Corn prices and number of searches by Google in the chart number 1,2,3.

Figure n. 1 Corn Prices and Percentage of Searches

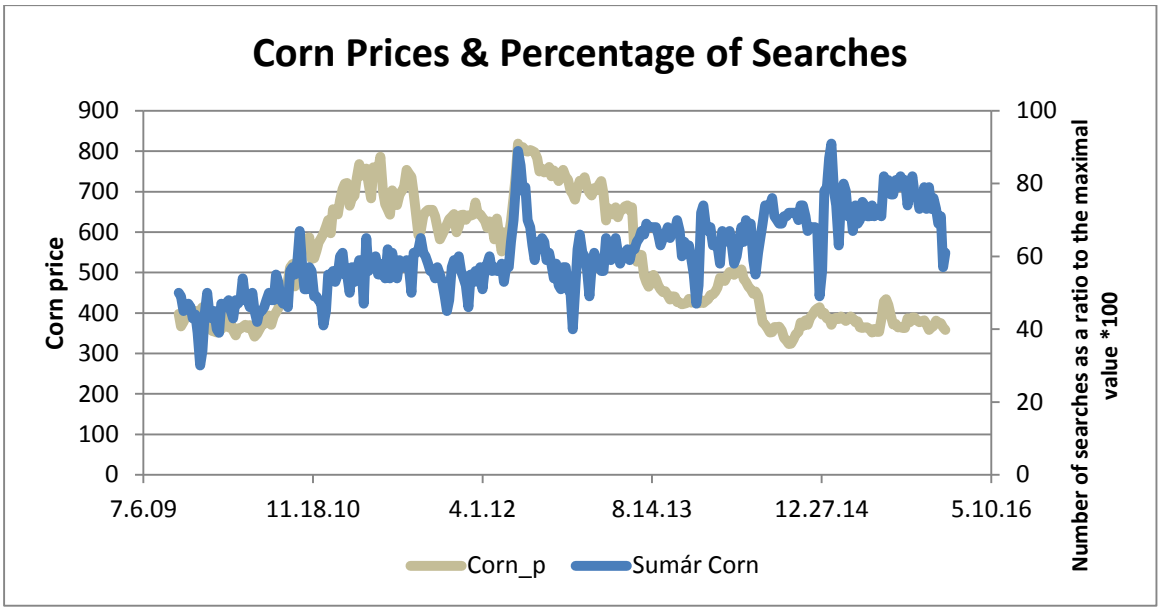

Figure n. 2 Wheat Prices and Percentage of Searches

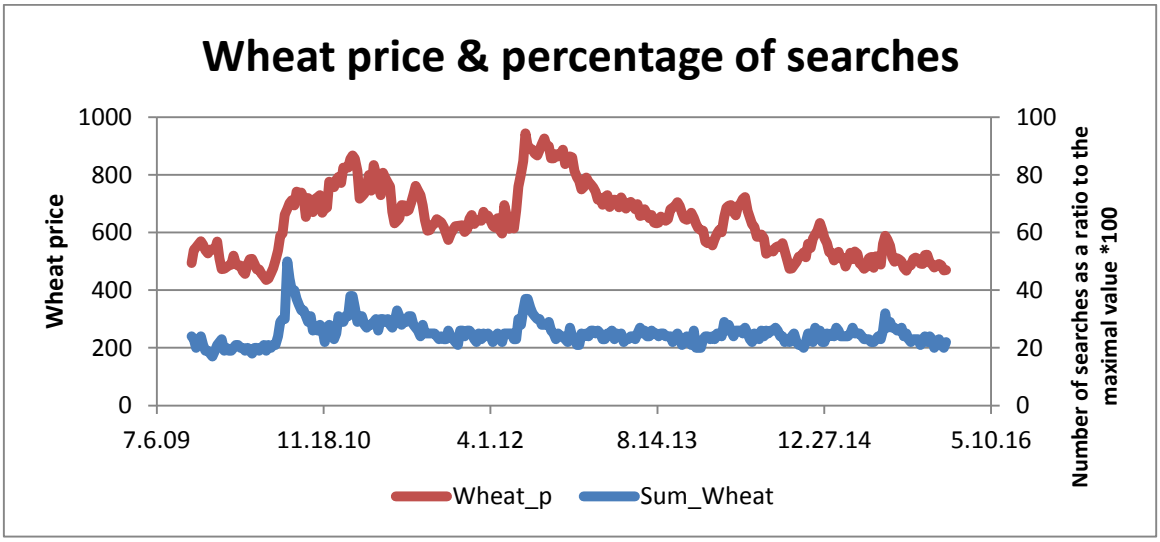

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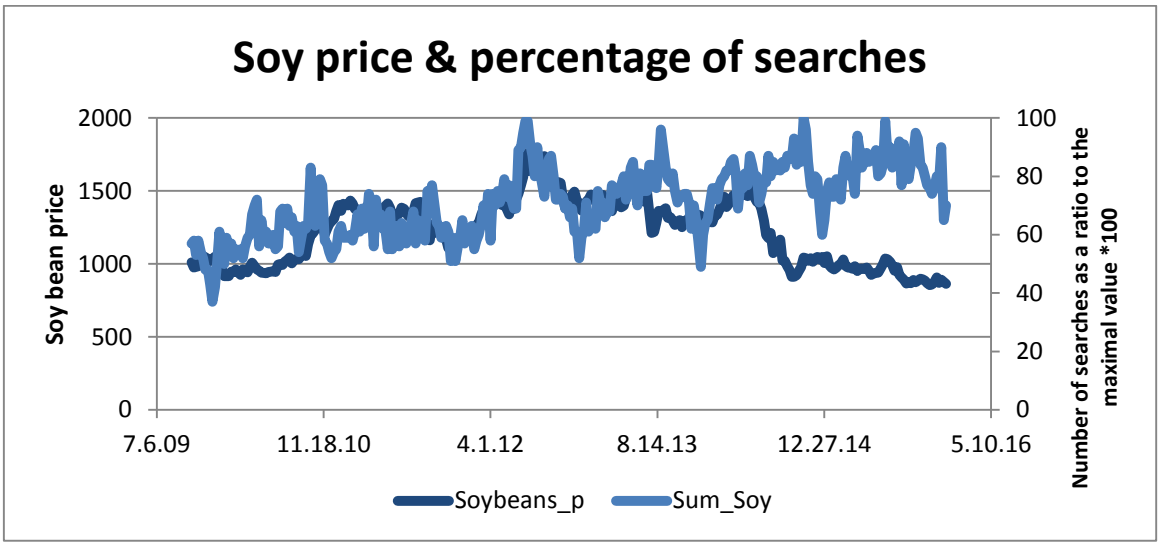
Figure n. 3 Soy Prices and Percentage of Searches



4. Conclusion

There is still a huge potential for investigating interconnection between attention driven investments and agricultural commodity prices. This paper is jus a beginning of our research. In the next step we like to add more parameters to our model and investigate the significance of news driven investments.

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Economic growth and its determinants across CEE countries

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Abstract
Over the last decades various economic approaches have been used to identify the sources of economic growth across individual countries. In our paper we use Growth Accounting approach developed by Solow to analyse the significant determinants of economic growth in ten Central and Eastern European countries over the time period from 2004 to 2012. The data source is Total Economy Database provided by The Conference Board. Total Economy Database is a comprehensive database with annual data covering GDP, population, employment, hours, labour quality, capital services, labour productivity, and total factor productivity for about 123 countries in the world. Total Economy Database was developed by the Groningen Growth and Development Centre (University of Groningen, The Netherlands) in the early 1990s and the database was extended with a module on sources of growth in January 2010. The contribution of labour quantity and quality, Information and Communication Technology capital services, non-Information and Communication Technology capital services and Total Factor Productivity to the growth of Gross Domestic Product is identified. Capital and Total Factor Productivity are found as a main source of economic growth. Moreover, the impact of Foreign Direct Investment inflow, investment on Research and Development, openness of the economy and life expectancy on Gross Domestic Product is identified.

Keywords: *CEE, Solow approach, Growth Accounting, Total Factor Productivity*

JEL Classification: *E13, O40*

1. Introduction

To think about the importance of economic growth we begin with assessing the long term performance of the Slovak economy. The real per capita Gross Domestic Product (GDP) in Slovakia grew from 6,300 EUR from 2004 to 13,300 EUR in 2013. This increase in per capita GDP corresponds to an average growth rate of 4.2 percent per year. To appreciate the consequences of apparently small differentials in growth rates we can calculate where Slovakia would have been in 2013, if it had grown since 2004 at 3.2 percent per year, one percentage point below its actual average rate. If Slovakia had begun in 2004 at the real per capita GDP of 6,300 EUR and had then grown at average 3.2 percent per year over the next 9 years, its per capita GDP in 2013 would have been 8,365 EUR, only 1.3 times the value in 2004 and 63 percent of the actual value in 2013 of 13,300 EUR. Then instead of ranking 46th in the world in 2013, Slovakia would have ranked 74th near Romania and Mauritius. Given perception helps us to highlight the importance of economic growth, not only in case of Slovakia, but across the whole world as well. What have a significant impact on the economic growth? Economists use various approaches to identify the elements of the economic growth. Researchers decompose economic growth into growth in labour, capital and productivity referred to as Total Factor Productivity (TFP) or Multifactor productivity (MFP). Determinants of the economic growth and TFP have been widely analysed by many authors. The majority of studies conclude that Foreign Direct Investment (FDI) inflow, economic freedom, Research and Development (R&D) expenditures, openness of the economy and life expectancy are positively and significantly correlated with GDP and TFP respectively.

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1.1. Literature review

The paper is focused on recent studies in field of growth accounting, where the growth in GDP can be decomposed into growth in Labour, Capital and Total Factor Productivity. Moreover, the literature review is specified on studies, where the contribution of other factors on GDP were analysed, namely FDI, R&D expenditures, patents application, life expectancy, trade openness.

The sources of economic growth in EU countries in period 1981-2003 were decomposed by Musso and Westermann (2005). They found TFP as the most important determinant of economic growth in EU 1980s. More than 50 % or 1.3 percentage points of GDP was explained by TFP, less than 50% or 1.0 percentage points was accounted for by capital while labour had a broadly neutral effect on growth due to the offsetting effects from increases in employment and decreases in average hours worked. For the 1990s the results show a small decline in average real GDP growth, which essentially reflected a decline in the contribution from TFP by around one-third to 0.8 percentage point. By contrast the contribution from capital was broadly unchanged compared with that in the 1980s and labour made a positive contribution of around 0.4 percentage point or almost 20% of real GDP growth. Research also shows that the contribution from labour force growth was 0.5 percentage point in both the 1980s and the 1990s. However, in the 1980s most of this contribution was offsetted by a rise in the unemployment rate and a decline in average hours worked. In the same character, the higher contribution to growth from the labour supply in the 1990s reflected a decrease in the unemployment rate and a slower decline in hours worked. Recent study of Dombi (2013) examined the direct sources of economic growth and development in 10 post-socialist Central and East European countries in the period from 1995 to 2012. Author performed an empirical analysis based on the methods of growth accounting and development accounting. The results of the growth accounting analysis in period from 1996 to 2008 demonstrated that the most important sources of economic growth in ten investigated economies was the accumulation of physical capital and the growth of Total Factor Productivity, while the growth of labour productivity had often a marginal effects only. According to Mühlberger and Körner (2014) the TFP was the main source of GDP growth in Central and Eastern European countries in the period from 1994 to 2011. As reported by authors the annual average output growth in observed period was 3.5 percentage points and more than 2.0 percentage points (57.14 %) was explained by TFP. Physical capital contributed to GDP by 1.3 percentage points (37.14 %) and human capital contributed to GDP by 0.2 percentage points (5.72 %). The contribution of TFP on GDP was significant in research of Arratibel et al. (2007), as well. Authors conducted research in the period 1996-2005 at eight new EU members states (Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia) and identified that TFP growth made a very significant contribution to GDP growth in all new EU member states, with the exception of Latvia. On the accounting side, given relatively small changes in labour and capital inputs, high GDP growth rates necessitated fast growth in TFP. The economic explanation is that the transition process (involving privatisation, restructuring, higher competition, deregulation in product and labour markets, opening to international trade, FDI inflows, transfer of technologies, etc.) had forced a more efficient use of production inputs and better managerial practices which were captured by TFP. On the other hand, for most of the new EU member countries the contribution of labour to GDP growth was very modest or even negative in 1996-2000.

Determinants of economic growth have been widely analysed by many authors. The majority of researches concluded that FDI inflow, R&D expenditures, patents applications, openness of the economy and life expectancy were positively and significantly correlated with GDP and TFP.

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Rapacki and Próchniak (2009) aimed to check whether the European Union (EU) enlargement contributed to economic growth of ten new member states from Central and Eastern Europe, including their real convergence towards the EU-15 development level. Authors econometrically tested the relationships between selected macroeconomic variables linked to the EU enlargement and the rate of economic growth of the CEE countries over the period 1996-2007. The variables comprised the progress of market or structural reforms, economic freedom, foreign aid and the FDI inflow. Their approach was based on neoclassical growth models (Solow, Mankiw) and beta and sigma convergence. Authors' results indicated that the EU enlargement significantly contributed to economic growth of the CEE countries and the econometric test of economic growth determinants unveiled that four variables were related to the EU enlargement: FDI inflow, economic freedom, progress of structural reforms, and aid inflow, were positively and significantly correlated with GDP growth rates in the CEE countries. Keller and Yeaple (2003) studied plants in the U.S.A (1987-1996) and found a strong link between FDI and growth. Approximately 14 per cent of productivity growth over this period can be attributed to FDI spillovers. Furthermore, FDI spillovers seems to be stronger in high-tech compared to other sectors. Popescu (2014) found FDI and export level as an important driver of economic growth. Author´s paper generated insights into the significance of trade and FDI for the economic growth of CEE counties, the influence of FDI on productivity growth, the features of financial intermediation in the CEE region and the effect of financial and capital limitations on FDI. Bloom et al. (2004) investigated the relationship between life expectancy at birth and economic growth. Authors included life expectancy in an aggregate production function in an attempt to establish whether health influenced labour productivity and TFP. They used panel data covering the period 1960 to 1990 for 104 countries and they found that increased life expectancy had a positive effect on growth. A one-year improvement in the population's life expectancy contributed to an output increase of 4 per cent in their research. Miller and Upadhyay (2002), covered 83 countries between 1960 and 1989 and found that trade measured as a percentage of export in GDP was positively associated with TFP growth. They also showed that human capital was a threshold variable as evidenced when their study aimed to investigate how the correlation changed with economic development. For high levels of per capita income trade had a positive significant impact, although its effects were negative for low per capita incomes.

2. Data and Methods

Data on growth accounting is obtained from Total Economy Database (TED) (TED, 2015a) provided by The Conference Board. TED is a comprehensive database with annual data covering GDP, population, employment, hours, labour quality, capital services, labour productivity, and total factor productivity for about 123 countries in the world. TED was developed by the Groningen Growth and Development Centre (University of Groningen, The Netherlands) in the early 1990s, and starting in the late 1990s, it was produced in partnership with The Conference Board. As of 2007, the database was transferred from the University of Groningen to The Conference Board, which has maintained and extended the database since then. In January 2010, the database was extended with a module on sources of growth, including labour quantity and quality, capital services (non-ICT and ICT), and total factor productivity (TED, 2015b). The following data are used from TED: GDP growth, labour (Labour Quantity and Labour Quality), capital (Non-ICT Capital Services and ICT Capital Services), Total Factor Productivity Growth (TFPG) and the Share of labour compensation in GDP. The data on factors affecting TFP growth is obtained from EUROSTAT database. We examine the impact of determinants as FDI inflow as a percentage of GDP, expenditures on Research and Development per person (RaD), openness of the economy expressed as a percentage of export

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on GDP (EX), life expectancy (LE) on GDP growth by regression analysis using statistical program STATA 12.0. The following table represents the descriptive statistics of the data used. As you can see, the data vary across the individual states of CEE region.

Table 1: Descriptive statistics of the data

Country	Variable	Mean	Std. Dev.	Min	Max	Country	Variable	Mean	Std. Dev.	Min	Max
Bulgaria	GDP	3.18	4.01	-5.14	6.68	Hungary	GDP	0.94	3.53	-6.78	4.68
	FDI	79.11	22.60	36.40	98.00		FDI	66.81	8.15	55.90	80.60
	RaD	22.36	7.72	12.80	34.60		RaD	101.34	17.95	71.30	126.60
	EX	50.77	8.28	41.10	63.40		EX	76.21	9.65	59.70	87.20
	LE	73.08	0.65	72.30	74.00		LE	73.49	0.83	72.40	74.60
Czech Republic	GDP	2.69	3.74	-4.96	6.65	Poland	GDP	4.21	1.63	1.75	6.95
	FDI	56.68	7.31	45.80	67.60		FDI	38.26	6.06	31.10	46.90
	RaD	183.77	52.96	107.90	273.90		RaD	55.31	19.69	29.80	90.10
	EX	65.36	5.99	57.40	76.60		EX	38.81	3.19	34.60	44.40
	LE	76.39	0.75	75.20	77.40		LE	75.23	0.69	74.40	76.20
Estonia	GDP	2.93	8.47	-15.94	9.91	Romania	GDP	3.13	5.23	-7.33	8.12
	FDI	79.21	6.38	70.90	87.00		FDI	36.40	7.08	24.60	44.80
	RaD	159.16	81.68	60.50	289.10		RaD	26.36	9.02	10.90	39.20
	EX	69.99	10.28	60.80	86.60		EX	32.29	3.90	26.90	37.50
	LE	73.87	1.60	71.90	76.00		LE	73.10	0.91	71.60	74.20
Latvia	GDP	2.97	8.62	-15.30	10.99	Slovenia	GDP	1.63	4.61	-8.12	6.71
	FDI	38.94	6.33	30.00	46.50		FDI	27.64	5.00	20.50	33.20
	RaD	50.51	17.13	20.50	71.70		RaD	307.73	95.22	190.10	451.60
	EX	46.24	8.97	38.50	61.50		EX	64.24	6.04	55.00	73.30
	LE	71.63	1.38	70.10	73.60		LE	78.11	1.08	76.50	79.40
Lithuania	GDP	3.35	7.77	-16.03	10.51	Slovakia	GDP	4.26	4.45	-5.44	10.15
	FDI	33.41	3.82	25.70	36.70		FDI	55.33	3.85	47.30	58.80
	RaD	69.87	19.50	40.30	99.30		RaD	60.13	25.65	32.40	108.30
	EX	59.82	11.75	47.40	81.70		EX	78.61	7.99	67.80	91.80
	LE	71.72	1.19	70.20	73.40		LE	74.52	0.76	73.70	75.70

Note: FDI – Foreign Direct Investments inflow, RaD – expenditures on Research and Development, EX – export as a % share in GDP, LE – life expectancy at 1 year

Source: own processing based on Eurostat data

2.1. Growth Accounting

Following methodology is based on TED methodology for the Growth Accounting approach (TEDc, 2015). As we state, the growth in GDP can be decomposed into growth in labour quality, labour quantity, growth in ICT capita, non-ICT capital and growth in TFP. TFP growth is not measured directly; rather, it is obtained as a residual after accounting for the contributions of all other factors of production to growth in output. Assuming a neo-classical aggregate production function, the output growth, in our case GDP growth, can be decomposed into the contribution of aggregate capital input (K), aggregate labour input (L) and aggregate total factor productivity (A) growth as:

$$\Delta lnGDP = \bar{v}_K \Delta lnK + \bar{v}_L \Delta lnL + \Delta lnTFP \qquad (1)$$

where v_K and v_L are the share of capital compensation and labour compensation in nominal GDP, both averaged over the current and previous years. Under constant returns to scale $v_K + v_L = 1$, so that the capital compensation share can be obtained by subtracting labour compensation from nominal value added. ΔlnK is the capital services growth rate and ΔlnL is

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the labour input growth rate. ΔlnTFP is the growth of total factor productivity. In paper, we present the contribution of labour, split into the contribution of pure employment quantity (LH) and labour quality (LQ), and the contribution of capital services split into ICT and non-ICT capital. Then the equation 1 can be rewritten as:

$$\Delta lnGDP = \bar{s}_{K,it}\Delta lnK_{it} + \bar{s}_{K,nit}\Delta lnK_{nit} + \bar{s}_L\Delta lnH + \bar{s}_L\Delta lnLQ + \Delta lnA \quad (2)$$

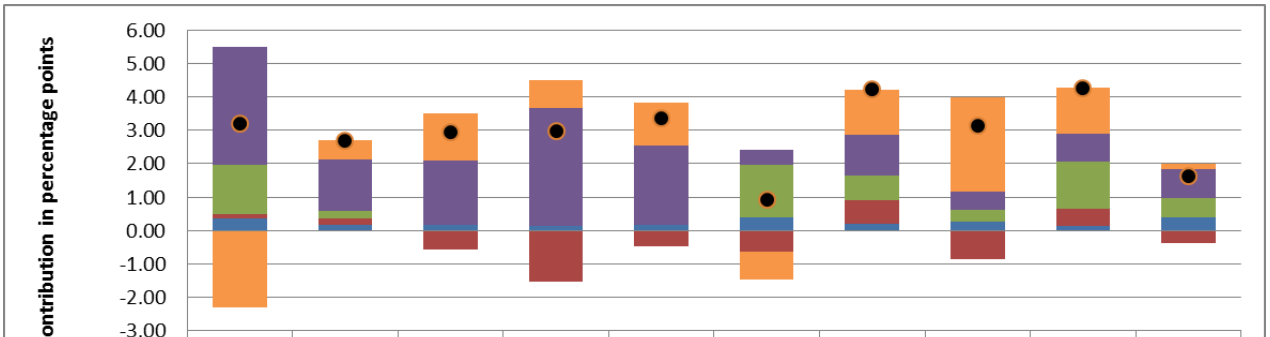
Subtracting ΔlnA from the equation 2 we can calculate the contribution of TFP to GDP growth as follows:

$$\Delta lnA = \Delta lnGDP - \bar{s}_{K,it}\Delta lnK_{it} - \bar{s}_{K,nit}\Delta lnK_{nit} - \bar{s}_L\Delta lnH - \bar{s}_L\Delta lnLQ \quad (3)$$

3. Results and Discussion

Following subchapter is based on the TED and deals with the decomposition of GDP growth. After averaging (2004-2012) the values for the variables which are necessary to calculate the contribution of LQ, LH, ICT, non-ICT capital and TFP to GDP based on TED, we can conclude the following results (Figure 1).

Figure 1: Decomposition of the sources of GDP growth



	Bulgaria	Czech Republic	Estonia	Latvia	Lithuania	Hungary	Poland	Romania	Slovak Republic	Slovenia
con. TFP	-2.30	0.58	1.40	0.84	1.30	-0.81	1.36	2.81	1.38	0.17
con. non-ICT	3.51	1.51	1.95	3.53	2.37	0.43	1.22	0.56	0.81	0.87
con. ICT	1.49	0.23	0.00	0.00	0.00	1.58	0.74	0.36	1.43	0.57
con. LH	0.12	0.19	-0.58	-1.53	-0.49	-0.65	0.69	-0.85	0.51	-0.37
con. LQ	0.36	0.18	0.16	0.12	0.17	0.39	0.20	0.26	0.12	0.39
GDP	3.18	2.69	2.93	2.97	3.35	0.94	4.21	3.13	4.26	1.63

Note: con – contribution in percentage points

Source: own calculations based on TED, 2015

The contribution of labour quantity (LH) was insignificant or even negative in cases of Hungary, Latvia, Romania, Slovenia, Estonia and Lithuania. Slightly positive contribution of LH to GDP was seen in the case of Slovak Republic and Bulgaria. The importance of labour quality (LQ) was moderate in case of Hungary, Slovenia and Bulgaria. These findings are in line with the findings of other authors. Dombi (2013) claimed that the contribution of labour in GDP was moderate, insignificant and even negative in CEE region over the period 2008-2012. Research of Mühlberger and Körner (2014) confirms our findings, as well. Contribution of ICT capital on GDP growth was important in case of Hungary, Bulgaria and Slovakia. In Hungary, the contribution of ICT capital had significant share on GDP of 168 %, while in

Bulgaria and Slovakia the share was 47 % and 34 %, respectively. In other countries in the CEE region the ICT capital contributed to GDP from zero percentage points in cases of Estonia, Lithuania and Latvia to 0.74 percentage points in case of Poland. Analysis revealed that, the contribution of non-ICT capital had the most significant impact on GDP growth in case of Bulgaria, Czech Republic, Estonia, Latvia, Lithuania and Slovenia. It accounted for the most in case of Latvia (119 % of GDP) and in Bulgaria (110 % of GDP). Dombi (2013) confirmed that the growth in capital had significant impact on GDP growth. We found similar results in studies of Arratibel et al. (2007), Iradian (2007) and Musso and Westermann (2005). Beside of contribution of labour quality, labour quantity, ICT capital and non-ICT capital, the contribution of TFP to GDP growth was also analysed. According to our research, the contribution of TFP to GDP had negative impact only in case of Bulgaria (-2.3 percentage points) and Hungary (-0.87 percentage points). TFP was the main source of economic growth in Poland and Romania. In the remaining countries in CEE region the TFP contributed to GDP form 0.17 to 1.40 percentage points.

According to our analysis, we state that the main determinants of economic growth in CEE region are the growth of non-ICT capital followed by ICT capital and TFP. Labour quality had only marginal effect on GDP and labour quantity even negative. The share of non-ICT capital on the GDP growth was in average 59 %, the share of ICT capital was 32 %, the share of TFP was 14 % and the share of labour quality and quantity on GDP growth was in average 11 % and -17%, respectively. The average growth of GDP in CEE region over the observed period from 2004 – 2012 based on TED was 2.93 %, while the best performer was Slovakia and the least was Hungary followed by Slovenia. We found that our results were identical, or very similar to other authors' findings. On the other hand, we found a discrepancy between the importance of TFP growth. Musso and Westermann (2005), Arratibel et al. (2007), Ganev (2005), Mühlberger and Körner (2014) stated that TFP had a significant impact on GDP growth, but growth in capital stock had a more significant impact on GDP growth than TFP growth.

Furthermore, we analysed the impact and the significance of selected variables on GDP growth. In order of the analysis we took FDI inflow as a percentage of GDP, expenditures on Research and Development per person (RaD), openness of the economy expressed as a percentage of export on GDP (EX), life expectancy (LE) into consideration. Based on regression analysis we can conclude that the determinants of GDP varied across individual states. As Table 2 indicates, the most common determinant of GDP growth across states was the openness of the economy. It can be caused by the fact that the countries in CEE region is mainly export oriented. It can be seen mainly in case of Slovakia and Estonia, where the share of export in GDP exceeds 70 %. The Life Expectancy at 1 year and Research and Development investments had also a significant impact on GDP growth. Foreign Direct Investments had significant impact on GDP only in the case of Hungary. The following table contains the significance level of t statistics. At level $\alpha=0.05$ it indicates that if *t stat is lower than 0.05* the selected variable has significant impact on GDP growth. Due to the clarity, the insignificant values of t stat are omitted. In case of Lithuania, we found all variables insignificant.

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Table 2: Level of significance (*t stat < 0.05)* of selected variables

	FDI	RaD	EX	LE
BUL				
CZE		0.002	0.006	
EST			0.002	0.002
LAT			0.019	0.008
LIT				
HUN	0.045			
POL		0.005	0.013	
ROM		0.001	0.003	0.000
SVN		0.004	0.014	
SVK			0.011	0.004

Note: FDI – Foreign Direct Investments inflow, RaD – expenditures on Research and Development, EX – export as a % share in GDP, LE – life expectancy at 1 year

Source: own processing

Our findings are in line with the findings of the other authors mentioned in literature review. We can conclude that the variable with the most significant impact on GDP growth over the observed period was the openness of the economy.

4. Conclusion

In previous several chapters we aimed to find the significant determinants of economic growth. Based on literature review we can conclude that we can divide the GDP growth into growth in labour, capital and TFP. Furthermore, we state that GDP growth can be decomposed to the contribution of labour quantity and quality, ICT capital services and non-ICT capital services and TFP, as well. Based on TED methodology, we applied the Growth Accounting approach in order to found the determinants of economic growth in CEE region. According to our analysis we stated that the key determinants of economic growth in CEE region was the growth of non-ICT capital followed by ICT capital and TFP. Labour quality had only marginal effect on GDP and labour quantity even negative. The share of non-ICT capital on the GDP growth was in average 59 %, the share of ICT capital was 32 %, the share of TFP was 14 % and the share of labour quality and quantity on GDP growth was in average 11 % and -17%, respectively. The average growth of GDP in CEE region over the observed period from 2004 – 2012 based on TED was 2.93 %, while the best performer was Slovakia and the least was Hungary followed by Slovenia. Moreover, we investigated the impact of selected variables on the economic growth represented by the growth in GDP. In order of the analysis we took FDI inflow as a percentage of GDP, expenditures on Research and Development per person, openness of the economy expressed as a percentage of export on GDP and life expectancy at 1 year into consideration. Base on regression analysis we found openness of the economy as a most significant variable with the impact on the GDP growth.

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Demand for food diversity in the case of Kosovo

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Abstract
Food nutrition security (FNS) is a multidisciplinary term that encompasses a set of the complex economic and social determinants. Recent food spikes were raising concerns on the food and nutrition security at all its levels (global, national, household and individual). In this paper we estimate demand for food diversity in Kosovo. Theoretical framework suggests that food diversity serves as a proxy for food and nutritional status at the household level. Here we employ standard OLS in order to estimate the impact of income (and other determinants) on the demand for the food diversity. Further, we compute relevant anthropometric indicator (Body Mass Index) in order to access the state of the FNS at the individual level. For the purpose of empirical estimation we use the HBS data on Kosovo covering the period 2005-2012. The main findings suggest that food diversity in Kosovo marked important improvement over the time period observed, reflecting the impact of rising income as a key determinant of the food diet. The pattern of the household food consumption remained diversified over the time period observed, but restricted by the low level of income. Food diversity in the urban households is significantly higher than in rural areas. Individual variables in the most of the cases were determined as significant. Anthropometric estimates were evidencing that prevalence of undernourishment is particularly critical in the case of school-age children, while the main nutritional problem among the adults is overweight.

Key words: *Food security, food diversity, BMI, Kosovo*

JEL Classification: *C12, D12, I15, Q18*

1. Introduction

The early 1970s instigated a period of the global food price instability. That time crisis altered rapidly bringing the humanity into the edge of food insecurity (Friedmann, 1993). From food crisis of the early 1970s until now, the absolute number of food insecure people was consistently around 850 million. Since 2008, more than one billion people were counted as food insecure (McDonald, 2010; McMichael and Schneider, 2011; Rosset, 2008). The recent food crisis has been associated with rising food prices and rising hunger rates across the world (McMichael and Schneider, 2011). Food price spikes are particularly harming poor people in developing countries. In such nations, food price volatility is leading to great hardship for consumers, reflecting the fact that food expenditure constitutes a significant proportion (60-80%) of the total income (Clapp and Cohen, 2009: Gilbert and Morgan, 2011).

Food security is a necessary but not sufficient condition for nutrition security (IBRD, 2012). Food security goes beyond the food production and distribution, therefore nutrition security is not necessary outcome of successfully achieving food security (Benson, 2004; Pinstrup-Andersen,

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2009). The extent to which food security results in good nutrition depends on a set of non-food factors such as sanitary conditions, water quality, infectious diseases and access to primary health care.

Darmon and Drewnowski (2008) show that socioeconomic conditions are important predictors of diet quality. Diets in the transition region of Europe (like Kosovo) are particularly monotonous, with the majority of energy coming from the consumption of starch and cereals (Swinnen and Van Herck, 2011). The situation has been improving but the share of starchy foods in total dietary energy consumption on average remains larger in the transition countries. The poorest face difficulties in obtaining access to food of sufficient quantity and quality to ensure a safe and nutritious diet. Darmon and Drewnowski (2008) also note that energy-dense and nutrient-poor diets are cheap and more consumed by those with limited means.

Despite the fact that food security became recently widely debated issue around the globe, research on the topic of food security remains scarce in the case of Kosovo. Most of the studies are devoted narrowly to the poverty constraints. Official reports (World Bank/KAS, 2013) stress their deep concerns on the high prevalence of poverty. It is estimated that 29.7% of its population in Kosovo lives below the poverty line, with 10.2% of the population living in the extreme poverty.

Kosovo as a small European economy is undergoing complex economic, political and structural adjustments of the transition process. It is considered to be self-insufficient in meeting domestic demand for the key food commodities. For example, referring to the latest data (2012), Kosovo satisfies 76% of domestic demand for wheat, while 24% is imported from the global market (MAFRD, 2012). Such an outcome is relevant, particularly taking into account that Kosovo is characterized as a “bread-eating country“(Lingard, 2003), where cereals constitute relevant share of the food diet.

Kosovo is a consumption driven economy. Aggregated data (Figure 1) provides clear suggestion that consumption marks the highest contribution on GDP. Over the last decade, country achieved a significant improvement on its economic accounts. However, economic growth has been well below the rate achieved in neighbouring economies and the level of per capita income is among the lowest in Europe. Many households depend on remittances from abroad to meet their consumption needs (Sen and Kirkpatric, 2011). Several constraints were shaping the weak development pattern during the last decade. Most important constraints driving country’s weak growth pattern involves inherited political profile, low investment profile economy, underutilization of resources due to the corruption practices, high level of unemployment, dependency on migrant remittances etc.

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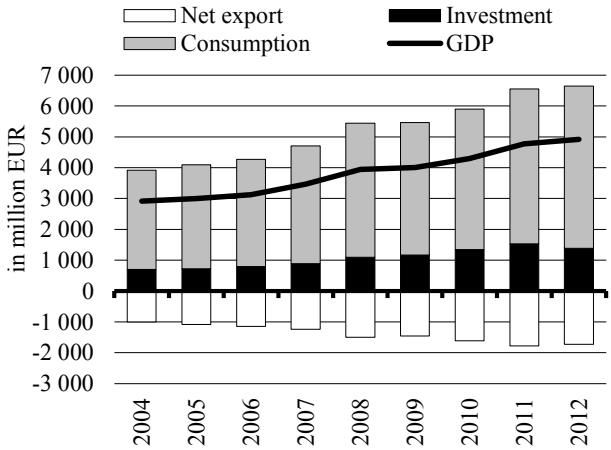

Figure 1: Main components of GDP in Kosovo
Source: Own elaboration based on the data of KAS

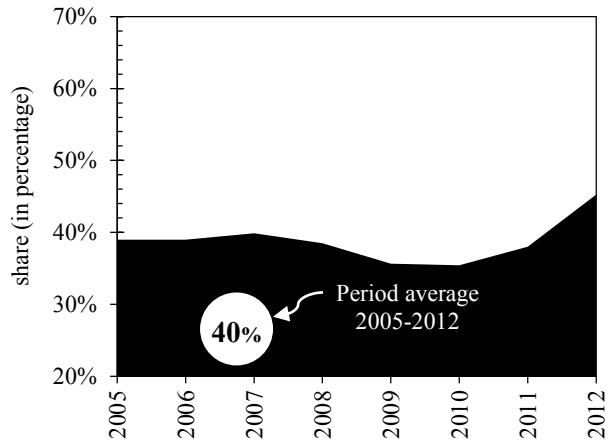

Figure 2: Share of food in consumption in Kosovo

.Food consumption marks the highest proportion on the total share of expenditures in Kosovo. The share of food expenditures in total consumption during the period 2005-2012 exceeds 40% (Figure 2).

2. Data and Methods

2.1 Theoretical framework on the demand for food diversity

Literature suggests that appropriate alternative in measuring food diversity is to employ the Berry Index (Berry, 1971). Berry Index has been applied in empirical economic studies to investigate food diversity (Thiele and Weiss, 2003; Stewart and Harris, 2005). Empirical studies based on individual household data so far have been devoted to studying actual consumption behaviour in different countries. For example, Moon *et al* (2002) addressed the demand for a varied diet in an economy in transition. They found out that the length of the time allowed for consumption is an important element in measuring the demand for food diversity.

Theoretical foundation of food diversity estimations of this paper is based on theoretical framework introduced by Jackson's (1984). Jackson's hierarchic model for food diversity suppose separability of food with non-food commodities, therefore we consider the utility maximization problem for q_j where $j = 1,...,n$ as follows,

$$u(q_j) = u(q_1, q_2, q_3, ..., q_n); \quad s.t. \sum_{j=1}^{n} P_j q_j = E \text{ and } q_j \geq 0 \tag{1}$$

where P_j shows the price for commodity j and E represents total food expenditure. Kuhn-Tucker conditions are satisfied by the maximization of $u(q)$ such that,

$$\frac{\partial u}{\partial u_j} - \lambda P_j = 0 \text{ if } j \in S \text{ and } q_j > 0, \tag{2}$$

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$$\frac{\partial u}{\partial u_j} - \lambda P_j = 0 \quad \text{if} \quad j \in \overline{S} \quad \text{and} \quad q_j = 0, \tag{3}$$

where the Lagrangian multiplier is denoted by λ, S is set of goods actually purchased, and $\overline{S}$ is set of goods not purchased. Solving through (1), (2) and (3), we obtain the Marshallian demand functions $q_j = g_j(P,E)$. If the condition (20) is fulfilled, then $g_j(P,E))$ is equal to zero meaning that in the optimum there should be zero consumption of the good j given the price vector and total expenditure. If we define $M(E) = \{i|_i g_i(P,E) > 0\}$ to represent set of goods in a purchased set given the prices, then the number of distinct food items purchased is determined by the cardinality of M as a function of the price vector and total expenditure.

Further, in assessing food diversity we use the Berry Index estimates (Berry, 1971). Berry-Index quantifies caloric share of food *i* on total calories:

$$BI = 1 - \sum_{i=t}^{n} s_i^2 \tag{4}$$

BI is bound between 0 and 1-1/n. BI is 0 in the case of no diversity, where there is total concentration in one item. BI is 1-1/n if the items are equally distributed. BI measures diversity proportionally; therefore high values of BI indicate high diversity within the sum of all items.

Since Berry Index lies in the interval between 0 and 1, the assumption of the normality may not be fulfilled. Therefore to overcome this problem, here is applied usual logistic transformation (Greene, 1997), as we could run the standard OLS estimates. The modified index is called Transformed Berry Index (TBI) and is computed as,

$$TBI = \ln\left[\frac{BI}{(1-BI)}\right] \tag{5}$$

2.2 Empirical assessment of food diversity

We apply our methodology to the Household Budget Survey (HBS) data. Our dataset consists of eight annual rounds, from 2005 to 2012. The survey provides detailed information on household incomes and expenditures on food and non-food goods and services. The data also contain detailed information on quantities consumed by each household, its location and size as well as individual head of household characteristics such as age, education, and working status.

In order to empirically estimate relationship between income and food diversity, we assess the standard OLS regression model as follows,

$$FD_i = \beta_0 + \beta_1 Y_i + \beta_2 H'_{ii} + \beta_3 HH'_{ii} + \beta_4 REG'_{ii} + \varepsilon_i \tag{6}$$

where FD_i represents Berry Index; Y_i is the logarithm of household's net monthly income; H'_i represents a vector of household's characteristics, such as size of household, urban; HH'_i represents a vector of characteristics of the head of household's including age, educational level, and working status; REG'_i are covariates of regional differences; and ε_i is error term. The income

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elasticity of the food diversity is measured directly by β_i when diversity is measured by the Berry Index. All estimations are carried out with correction for heteroschedasticity and robust standard errors are reported.

2.3 Assessment of the anthropometric indicators

Anthropometric literature defines nutritional anthropometry as measurement of the physical dimensions and gross composition of the human body as a means of assessing nutritional situation (WHO, 1986; Shetty, 2003; Gibson, 2005; Neufeld and Osendarp, 2014). In terms of practical application there is general agreement that anthropometric indicators serve as the most powerful tools to determine nutritional status of individuals and populations (WHO, 1986; Victora, 1992). An added value of these indicators lays on their ability to discriminate between different physiological and biological factors (Gorstein *et al*, 1994). As explained by Cook and Frank (2007) poor nutrition influences health and wellbeing through the life cycle, from the prenatal period on into elder years. The anthropometric indicators were determined by Reinhard and Wijayaratne (2002) as food and nutrition security impact indicators that assign the level to which the food is utilized and converted into satisfactory nutrition status. The most frequently anthropometric indicators used for such a purpose are Body Mass Index (BMI) or weight-for-height, height-for-age, and weight-for-age.

2.4 Computation of the Body Mass Index (BMI)

Due to the data limitations, research objective of this section is to compute Body Mass Index (BMI), based on the differentiation of the population sample between adults (+16 years) and pre-school children (6-16 years old). Body Mass Index (BMI) depends on the net energy intake and varies through the human life cycle. It captures both long and short term dimensions of nutrition. Relationship between BMI and food security was observed in several studies (Dubois *et al*, 2011; Thomas and Frakenberg, 2002) assuming that in developing countries food insecurity is related with higher odds of being undernourished, while in developed countries food-insecure households have higher odds of being overweight or obese.

BMI is calculated by dividing individual weight by the square of individual height:

$$BMI = \frac{Body\ \ weight\ \ (kg)}{Body\ \ height\ \ (m)^2} \tag{7}$$

According to the World Health Organisation (WHO, 2014), the BMI is an indicator for food intake, which is commonly used to classify underweight, overweight and obesity. It ranges from 18.5 to 25, where BMI lower than 18.5 indicates underweight, while BMI higher than 25 indicates overweight. Variation of the BMI between 30 and 39.99 differentiates the levels of obesity.

2.5 Data availability

Concerning the data management of the HBS dataset we decided to aggregate the HBS data of the food expenditure into five main categories: cereals, meat and fish, dairy products, fruits and vegetables and other food products. Similar approach was applied in several studies in different countries such as Smith and Subandoro (2007). One of the data restrictions in estimating anthropometric indicators were the data availability in the individual level (body weight, body height and age) only for the year 2012. The main research limitation in this case is inability to

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explain potential changes between two (or more) time periods. The 2012 HBS sample includes 18,556 individuals living in 2,347 households, with an average household size of the 5.5 members.

3. Results and Discussion

3.1 Preliminary assessment of the food diversity

Large number of empirical studies has been devoted on consumer demand analysis. However, according to Thiele and Weis (2003) much less attention has been paid to the household's demand for food diet variety (the number of different products consumed in a specific time period). Estimates of the Berry Index (BI) made in this section give a straightforward outcome in the explaining the main drivers of food diversity in Kosovo.

Results suggest that Kosovo households consume diversified food pattern and since 2005 food diversity marked an upward trend (Figure 3). The main contributor on increasing food variety is devoted to the increase in income. Moreover, distinction between the urban and rural areas provides information on the differences of food diversity in the case of Kosovo. Berry Index (BI) estimation explains that urban households tend to enjoy more diversified food diet than those in the rural settlements. Such an outcome is complementary with the theoretical framework and empirical findings on food diversity (Drescher, 2007). Accordingly, aggregated HBS data (Figure 4) indicates relatively proportional distribution of the food categories consumed in Kosovo households. Food consumption of the Kosovo households is diverse in terms of variety, but remains poor in terms of income. This is particularly true in the case of rural areas and marginalized social groups.

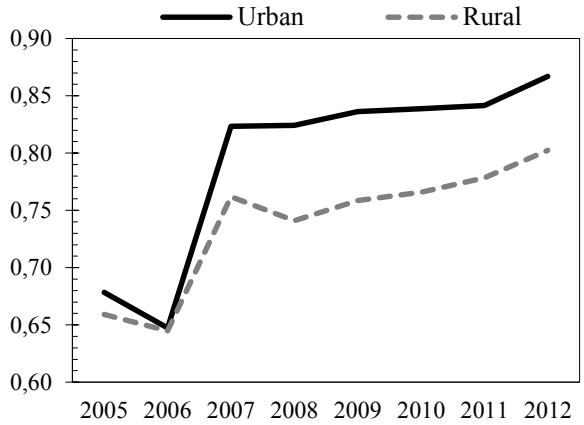

Figure 3: Berry Index in Kosovo

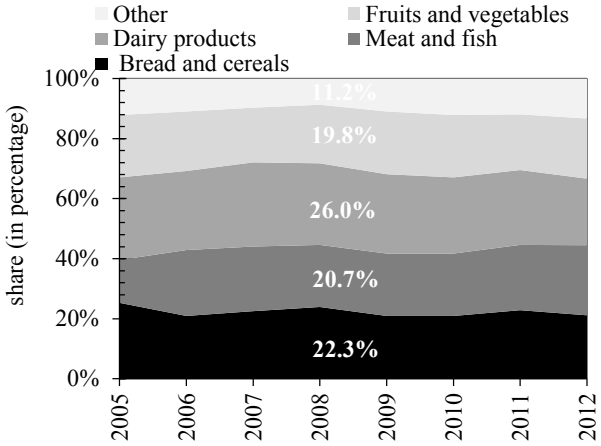

Figure 4: Diversity of food consumption

Source: Own elaboration based on the HBS data of KAS

In order to confirm such preliminary indication provided here, in the next section we estimate the Berry Index (BI) of food diversity by using the microdata from the HBS and applying for food diet assessment.

3.2 OLS estimates on the food diversity

Our results (Table 1) show that food consumption in Kosovo became more diverse over the observed time period. Moreover, estimates suggest that food consumption tends to be more diverse

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in the urban areas, and varies across Kosovo regions. These findings are consistent with the study done by Thiele and Weiss (2003) confirming that households living in larger cities tend to enjoy higher food diversity than people living in rural areas. Previous literature suggests that income is the most important variable that is positively correlated with the demand for food diversity (Drescher, 2007; Ogundari, 2013). This is confirmed by our results from Kosovo. Interestingly, based on the findings of our empirical analysis, size of household has significantly negative impact on the demand for food diversity. The larger the size of household, the lower food diversity is observed, ceteris paribus. This outcome is in accordance with the findings of several previous studies (Stewart and Harris, 2005), but at the same time our results is in contradiction with the findings presented by Drescher (2007) who suggests that different household members have different needs and it is likely that food diversity increases with increasing the size of the household. Individual control variables of the head of household (age, education and working status) were determined to have significant impact in our model. There is a positive impact of employment status of the head of household on demand for food diversity in Kosovo. Demand for food diversity also increases with the level of education of the head of the household. Education is considered as a proxy variable for dietary knowledge (Variyam *et al.*, 2002), therefore better-educated consumers are more aware of the importance of a diversified diet (Drescher, 2007). Finally, the age of the head of household has relevant but significantly lower impact on the demand for food diversity.

Table 1: Food diversity OLS estimates (pooled sample, 2005-2012)

TBI	Coef.	Std. Err.
ln_Income	0.081***	0.005
$ln_p_{cereals}$	2.694***	0.054
ln_p_{meat}	0.059	0.036
ln_p_{dairy}	-0.259***	0.042
ln_p_{fruits}	-0.682***	0.048
ln_p_{other}	0.074***	0.021
Household size	-0.014***	0.002
Education	0.118***	0.010
Age	0.005***	0.001
Working status of the head of household	0.090***	0.017
Urban	0.330***	0.013
$Year_{trend}$	0.050***	0.004
Gjakova	0.327***	0.020
Gjilani	0.381***	0.022
Mitorvica	0.344***	0.026
Peja	0	(omitted)
Prizreni	0.312***	0.019
Prishtina	0.408***	0.020
Ferizaj	-0.035	0.028

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Constant	-101.842***	8.087
Prob > F	0,000	-
R-squared	0.358	-
Number of observations	18,556	-

Note: *P<0.1, **P<0.05, ***P<0.01. Variable of Peja is omitted from regressions because of the colinearity problem.
Source: Own elaboration based on the HBS data of KAS

3.3 Results on Body Mass Index (BMI) computation

BMI (Body Mass Index) is considered as one of the most commonly used indexes in determining the level of undernourishment, overweight and obesity. In the case of Kosovo, the total sample size used for BMI estimations consisted from 18,556 individuals. The main outcome of estimation indicates that around 12% of the individuals in Kosovo are classified as undernourished, and a half of the individuals (50.5%) are categorized at the level of the normal weight. Individuals that cope with overweight are present at 28.5% of the sample. While around 9% of the individuals are categorized as obese (from 1st to 3rd class).

Table 2: BMI estimations in Kosovo (2012)

BMI categories	**Total sample**		**Children (6-16 years)**		**Adult (+16 years)**	
	Frequency	% share	Frequency	% share	Frequency	% share
Undernourishment	1,532	11.75	882	32.31	225	2.38
Normal weight	6,663	51.11	1,420	52.01	5,160	54.55
Overweight	3,674	28.18	214	7.84	3,366	35.58
Obesity of 1st degree	777	5.96	87	3.19	608	6.43
Obesity of 2nd degree	163	1.25	56	2.05	67	0.71
Obesity of 3rd degree	227	1.74	71	2.6	34	0.36

Source: Own elaboration based on the HBS data of KAS

BMI estimations vary when discriminating for the age population between the school-age children (6-16 years) and adults (+16 years) (Table 2). Common denominator of BMI estimations in this case evidences the acute undernourishment in the case of school-age children (0-16 years). More than a third (32.3%) of the school-age child sample suffers from undernourishment. On the other hand, in the case of the adult population (+16 years) more than 35% of population experience overweight. Differentiated estimates of BMI between urban and rural residence of individuals sample brings similar findings we presented above (Figure 5).

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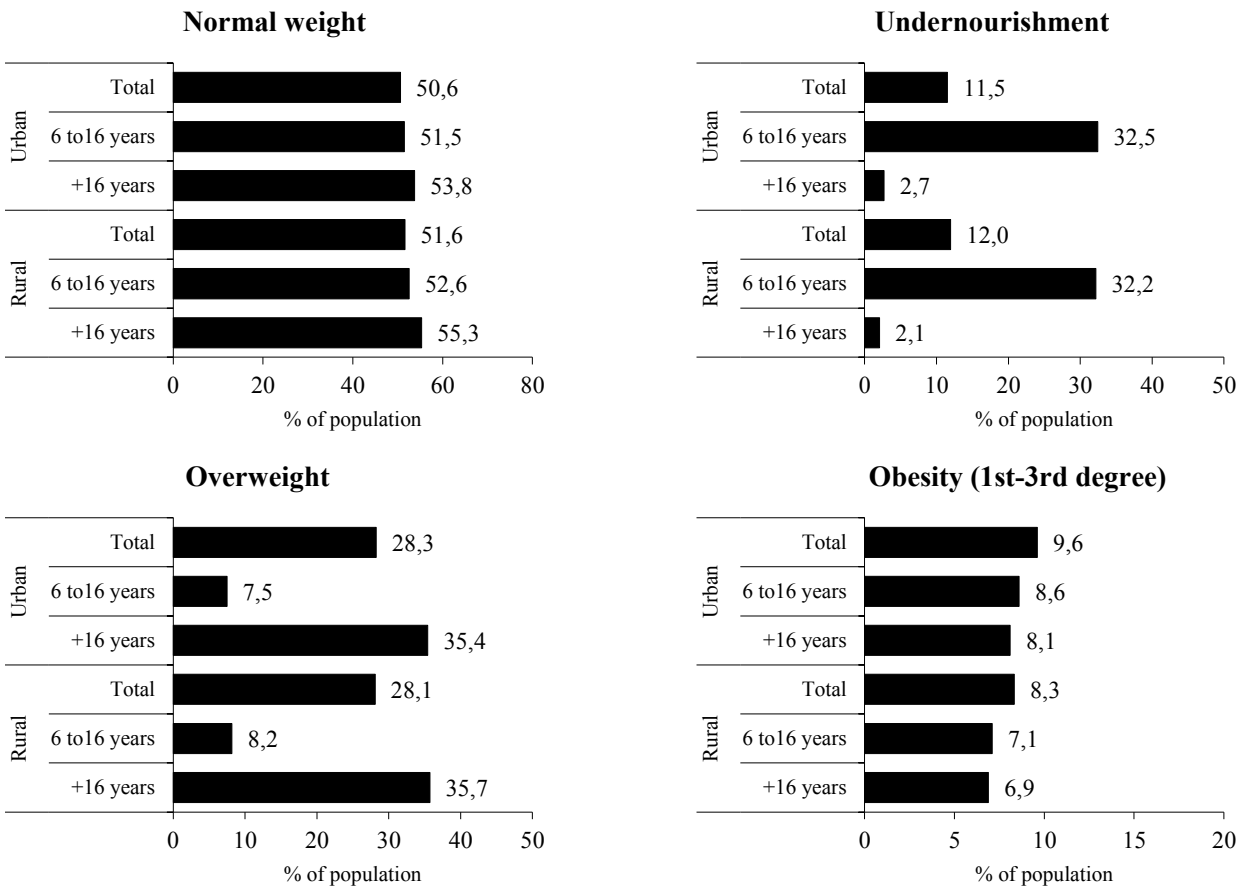

Figure 5: BMI estimations for the school-age children and adults in Kosovo (2012)

Source: Own elaboration based on the HBS data of KAS

One of the limitations on the empirical estimations at this section is unavailability the monthly birth data for measurement stunting and wasting among the pre-school children (0-5 years). Previous studies in the case of Kosovo for the related field are scarce, and most of the research is done on the medical field (Hoxha *et al*, 2014; Lokaj-Berisha *et al*, 2014; Rysha, 2013). However, some interesting findings of early research studies is worthy to mention here. For example, early study report on anthropometrics was conducted by international organizations (AAH, 1999) aiming to capture the state of malnutrition among the children (0-5 year) immediately after the period of war (1999). Another anthropometric study conducted by Volken and Rüesch (2012) integrates Kosovo migrants living in Switzerland. And most recently, UNDP in Kosovo (2014) reports that children fall under the most vulnerable demographic groups in Kosovo, where around 15.5% of them face stunting and inadequate nutrition.

4. Conclusion

The main findings of this paper reveal that Kosovo at the national level is significantly exposed to the food security risks, mainly driven by the high level of poverty, high unemployment, low income level, food self-insufficiency and sharp food trade deficit.

Food diversity analysis reveals that distribution of the food categories remained significantly diversified over the time period observed, but poor an restricted in terms of income. Berry Index (BI) estimations explained that despite the significant improvement of the food diversity since 2005, major constraints of the food diversity are evident in the rural areas and marginalized social groups. Further, OLS estimates affirmed that food pattern became more diversified over the investigated time period. Food diversity is negatively related to the size of household, and varies across the Kosovo regions. Relevant variable in determining food diversity is level of education of the head of households and his employment status, while the age variable has a lower explanatory power on food diversity. Most importantly, OLS estimates indicate existence of strong positive relationship between the income and food diversity. Therefore, income driven policies should be prioritized in order to improve nutrition aspects of food diversity. We should expect that Kosovo will improve its nutrition diet by passing through the so called "nutrition transition" (Doan, 2014). This should take place as the result of the improved income status of the Kosovo households.

Anthropometric assessment of the two age cohorts, school-age children (6-16 years) and adults (+16 years) conveys worrisome message on the state of nutrition security at the individual level. Computed anthropometric variables also show that food security is a major problem in Kosovo, especially among school children and in rural areas. Results were indicating that 12% of total sample suffer undernourishment. Particular concern on individual nutrition status is evident among the children, where about a third (32.3%) of this age group is coping with low food intake. BMI on adults were signalling occurrence of overweight problem, such an outcome is found in more than 35% of adult sample. Overweight and obesity however is not a food intake indicator occurring only in developed countries.

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Selected aspects of talent management in companies in Slovakia

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Abstract
Talent management is now an important aspect of human resources development in enterprises. It represents strategic view to the human resources management. The paper accents the necessity of the talent management process and carrier planning in successful management process. It focuses on the evaluation of the talent management application in enterprises of Slovakia. Main phases of the talent management process (talent identification, talent assessment, talent development and talent retention) are examined in this paper in line with the corporate and human resources strategy. Each phase will be assessed according to the survey of 288 companies operating in Slovakia. It goes to identify dependencies between the level of talent management and determinants (the size of the company, the existence of foreign capital in the enterprise, economic situation) and the establishment of the organizational entity for human resources management). In the conclusion, suggestions to improve the work with talents are provided which resulted from the interviews with managers of selected companies.

Keywords: *talent management, strategy, talent identification, talent development, talent retention*

JEL Classification: *M10, M12, M14*

1. Introduction

The role of human resources in organizations is still very important. Capital and material sources are important but human resources are the main sources in each company. Only high quality people can create added value leaded to competitive advantage on the market. McKinsey group used the phrase the War for Talent in 1997 and it was the starting point for the research topic of talent management in practitioner and academic sphere. The fact that talent management is an attractive and developing academic topic was main motivation for writing this paper. We would like to clarify some relationships between talent management and selected determinants.

Talented individuals can help a lot in process of successful management and it is a reason why we can name talent management as a key component to business success in the current economic conditions. Money allocated to the human resources development must be named as an investment, not as costs. Recruitment of the top talents in an organization can help to increase productivity which leads to better economic results and part of the profit can be invested to support talented individuals in the company.

1.1 Talent and Talent Management

There are many definitions of the term talent. Thorne and Pelant (2006) define talent as someone who has ability above others. These people excel with easiness and grace. We agree with definition by Gagne (2000) who designates talent as the superior mastery of systematically developed abilities and knowledge in at least one of the field of the human endeavour.

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Talent management is defined as a systematic and dynamic process of discovering, developing and sustaining talent (Egerová et al. 2015). According to Armstrong (2006) talent management should not only focus on the high-flyer, but it should concern all the assiduous and efficient workers.

Talent management introduces new strategic goals to streamline hiring and leadership succession processes using the employee lifecycle model. The issue of talent management has become an important area for research (Ashton and Morton, 2005 and Sparrow et al., 2004). European perspectives of talent management are investigated by Collings, Scullion & Vaiman (2011). Talent management is likely to challenge many traditional management practices and attitudes which continue to dominate in the period of transition to a market economy (Skuza, Scullion & McDonnell, 2012). Talent management brings a requirement to create new human resources management tools, methods and processes to provide the necessary co-ordination systems. (Kim, Park, & Prescott, 2003).

Maximizing the talent of individual employees as a unique source of competitive advantage has been a central element of strategic human resources policy in recent years (Frank and Taylor, 2004 and Lewis and Heckman, 2006). It means that talent management became important strategic question. Strategic talent management as activities and processes that involve the systematic identification of key positions which differentially contribute to the organisation's sustainable competitive advantage, the development of a talent pool of high potential and high performing incumbents to fill these roles, and the development of a differentiated human resource architecture to facilitate filling these positions with competent incumbents and to ensure their continued commitment to the organisation (Collings and Mellahi, 2009). Investigation about effectiveness of talent management strategies has been provide by Bethke-Langenegger, Mahler and Staffelbach (2011). They found that the talent management focusing on retaining and developing talents has a statistically significant positive impact on human resource outcomes such as job satisfaction, motivation, commitment and trust in leaders. Moreover, talent management practices with a strong focus on corporate strategy have a statistically higher significant impact on organisational outcomes such as company attractiveness, the achievement of business goals, customer satisfaction and, above all, corporate profit, more so than any other areas that talent management focuses upon. Size of the enterprise as an important factor influencing human resources management is investigating in more scientific paper by Holátová et al. (2014) and Březinová (2014).

Excepting strategy, there are also other phases of talent management process. According to Silzer and Dowell (2010) model of integrated talent management includes following phases: strategy, talent identification, talent assessment, talent development, and talent retention. There have been several studies investigating firms' promotion decisions (Breaugh, 2011 and Waldman, 2013). Most of these studies focused on explaining promotion tournaments, that is, they study how managers compete among each other in order to be promoted to the next job hierarchy level (DeVaro, 2006).

Talent management should be the challenge for all companies which would like to grow and reach competitive advantage in the business. There are many factors that influences level of talent management. Talent management must be included into corporate strategy, business strategy, and human resources strategy to meet all goal connected with human resources development and with higher productivity.

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2. Data and Methods

The way of the research implementation and the methods used in the research are described in this section. Selective survey was used as a method for data collection. It means that the chosen data are only part of the basic file and therefore the accuracy of the results is limited. (Munk, 2013). A scaled questionnaire was used as a tool of collection that contained 41 items (divided into 5 field according to talent management process phases) and other classification items such a size of the company, economic situation, foreign capital, and existing of HR department in the company. In this paper, only some of the most interesting were used. Here is the list of the items with marks used in the paper.

Table 1: List of the items and their marks

I 1	Talent management is an important part of the corporate mission
I 2	Human resource strategy is clearly defined.
I 3	Strategy for talent management is clearly defined.
I 4	There is looking for talent in each newly employed person.
I 5	Jobs are divided into key and others.
I 6	Recruitment system allows you to get a person of the highest growth potential.
I 7	We know what kind of talents will be needed in the future.
I 8	There are carried out special activities focused on talent acquisition.
I 9	Talent management is linked to the reward system.
I 10	There are no clearly defined criteria for evaluating employees.
I 11	The above-average abilities and skills are not taken into account in the process of recruitment.
I 12	It is the system of career development of talented employees well thought.
I 13	There is not enough time to develop the talent of employees.
I 14	Enterprise has sufficient financial resources to develop the talent of employees.
I 15	Retention of talented employees is successful.
I 16	There is a communication problem with talented employees
I 17	We do not use specific procedures to support talented workers.

Source: own processing according to questionnaire

The items of the questionnaire were scaled according to Likert from 1 to 5, where 1 means absolute disagreement of the respondent, 5 means absolute consensus and figure 3 expressed irresolute attitude of the respondent. We added also figure 0 enabled the respondent not to comment on a given item. The questionnaire was distributed electronically via online form. This questionnaire was created by group of scientists collaborated on common project and it was used in papers of scientific journals (Egerová et al., 2013).

Reliability of the questionnaire was verified by means of Cronbach´s alpha. According to Nunnally and Bernstein (1994) the evaluation of scales is based on examining the correlations between the individual items or measurements in relation to the variability of the items. The values of Cronbach´s alpha higher than 0.7 shows on sufficient scale consistence. In our case Cronbach´s alpha reached level 0.83.

We formulated following hypothesis and research questions:

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Hypothesis No. 1: The strategic approach of talent management process represented by human resources strategy (item 2) is determined by the all selected factors (size of an enterprise, foreign capital, economic situation, and HR unit).

Hypothesis No. 2: The strategic approach of talent management process represented by talent management strategy (item 3) is determined by the all selected factors (size of an enterprise, foreign capital, economic situation, and HR unit).

Hypothesis No. 3: There is statistically significant difference in carrying out of special activities focused on talent acquisition (item 8) between enterprises with and without HR unit.

Hypothesis No. 4: The assessment of the talents representing by special reward system (item 9) is determined by the economic situation of the enterprise.

Hypothesis No. 5: Level of sufficient financial resources for talent development (item 14) is determined by the foreign capital allocated in the enterprise.

Non-parametric statistical methods were used because of the data structure and data nature. Existence of statistically significant differences between individual groups of respondents were tested by the Kruskal-Wallis test, Jonckheere-Terpstra test and Mann-Whitney test. All identified differences are highlighted in the tables.

3. Results and Discussion

In this paper, we would like to refer some important relationships between the level of talent management and some important determinants. We focused on the determinants such a size of the company, existence of foreign capital in the enterprise, economic situation and existence of human resources unit in the enterprise.

This quantitative research study was conducted between June 2013 and November 2015. Research sample consisted of 288 companies operating business in Slovakia. In the determinant size of the enterprise, the intervals were set according to the EU´s enterprise size typology (see table 2). Each enterprise was represented by owner, or employee responsible for human resource management.

Table 2: Size of the enterprise

		Frequency	Percent
Valid	small (10-49 employees)	131	45.5
	medium (50-249 employees)	88	30.6
	large (250 and more employees)	67	23.3
	Total	286	99.3
Missing		2	0.7
Total		288	100.0

Source: own processing

According to factor of existence of foreign capital in the enterprises we searched if there is any foreign capital allocated in the company. 59% of searched enterprises dispose of foreign capital and 40.3% of enterprises have only Slovak capital. Two respondents did not fill this classification question (see table 3).

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Table 3: Foreign capital in the enterprise

		Frequency	Percent
Valid	yes	116	40.3
	no	170	59.0
	Total	286	99.3
Missing		2	0.7
Total		288	100.0

Source: own processing

In the research sample there are 42% of companies without economic change in last year. 10.4% of enterprises shows worse and 47.6 better economic results in last year (see table 4).

Table 4: Economic situation in the enterprise

		Frequency	Percent
Valid	without change	121	42.0
	worse	30	10.4
	better	137	47.6
	Total	288	100.0

Source: own processing

As we can see in table 5, there are 64.6% of enterprises where is any organizational unit providing human resources management (for example department of human resources management, or supervisor for human resources). On the other hand, there is 35.1% without any organizational unit of human resources management in our research sample. In these enterprises, there is human resources management providing by owner or randomly by any person. One representing person did not answer on this item.

Table 5: Existence of HR unit in the enterprise

		Frequency	Percent
Valid	yes	186	64.6
	no	101	35.1
	Total	287	99.7
Missing		1	0.3
Total		288	100.0

Source: own processing

As stated in the table 6, we examined the determinant size of the enterprise in our research. There exist statistically significant differences in items 2, 3, 7, 8, 11, 14, 15, and 17. Size of the enterprise is an important factor influencing strategic approach of the talent management representing by human resources strategy (I 2), and by the strategy of talent management (I 3). We consider that the strategy of talent management is more often and on higher quality level formulated in medium and large companies. It will be call for further research to test it. Size of the enterprise is a significant factor influencing identification of the talents representing by the knowledge about talents needed in the future (I 7) and carrying out special activities focused on talent acquisition (I 8). In the process of talent assessment we did not find item influenced by the size of the enterprise. Process of talent development is influenced by the size in two cases – that above-average abilities and skills are not taken into account in the process of recruitment (I 11) and there are sufficient financial sources for talent

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development (I 14). We consider that development is connected with better carrier opportunities in medium and especially in large companies. Testing of this will be other subject of our further research. Last phase of talent management process is talent retention. Size of the enterprise is determinant of the item about success in talent retention (I 15) and item connected with using specific procedures to support talents (I 17).

Table 6: Verification of the differences – size of the enterprise

item	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9
p value	0.102	0.000	0.000	0.610	0.596	0.389	0.022	0.001	0.159
item	I_10	I_11	I_12	I_13	I_14	I_15	I_16	I_17	
p value	0.083	0.004	0.152	0.600	0.014	0.049	0.293	0.016	

Source: own processing

Regarding the factor of foreign capital we can see statistically significant differences in items 2, 3, 8, 9, 10, 12, 13, 14, and 17 (see table 7). Foreign capital allocated in the company is important determinant influencing strategic approach of the talent management representing by human resources strategy (I 2), and by the strategy of talent management (I 3). We consider that the strategy of talent management is more often formulated in companies with foreign capital. It will be call for further research to test it. Foreign capital influences also identification of the talents representing by carrying out special activities focused on talent acquisition (I 8). Differences in talent assessment system we can see in companies with foreign capital compared to companies without foreign capital (I 9, and I 10). Development of talents is also determined by existence of foreign capital in the enterprise. We can see differences in system of carrier planning (I 12), in the time spent for talent development (I 13), and in sufficient financial sources for talent development (I 14). Foreign capital is also determinant of the item connected with using specific procedures to support talents (I 17). We consider that better support activities for talent individuals could be seen in companies with allocated foreign capital. It will be call for our further research.

Table 7: Verification of the differences – foreign capital

item	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9
p value	0.165	0.000	0.000	0.951	0.249	0.220	0.418	0.000	0.025
item	I_10	I_11	I_12	I_13	I_14	I_15	I_16	I_17	
p value	0.006	0.679	0.000	0.017	0.010	0.460	0.770	0.024	

Source: own processing

Economic situation was another searched determinant of talent management process. According to the results of our research, we identified statistically significant differences in items 2, 3, 4, 6, 9, 12, 13, 14, and 15 (table 8). We name only some interesting differences. There is a difference in the system of recruitment oriented on talents with the highest potential (I 6). We consider that recruiters are more motivated to find higher quality talent in the enterprises with better economic situation. It should be other subject of the research in the future. Success in retention (I 15) is also determined by economic situation. We consider that companies with better economic situation have better opportunities to retain talented individuals who are motivated with higher salary. We should test it in further research.

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Table 8: Verification of the differences – economic situation

item	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9
p value	0.020	0.017	0.011	0.037	0.383	0.002	0.225	0.399	0.019
item	I_10	I_11	I_12	I_13	I_14	I_15	I_16	I_17	
p value	0.167	0.346	0.008	0.006	0.000	0.007	0.145	0.342	

Source: own processing

Existence of HR unit is last searched determinant of talent management process in our research. There exist statistically significant differences in items 2, 3, 6, 7, 8, 10, 12, 14, and 17 (see table 9). We would like to name some interesting differences found in this factor investigation. Existence of HR unit is an important factor influencing strategic approach of the talent management representing by human resources strategy (I 2), and by the strategy of talent management (I 3). We consider that company with any HR unit can name some people to be responsible for formulation of the strategy and they are able to spend more time for this process.

Table 9: Verification of the differences – existence of HR unit

item	I_1	I_2	I_3	I_4	I_5	I_6	I_7	I_8	I_9
p value	0.138	0.000	0.002	0.274	0.069	0.006	0.033	0.000	0.089
item	I_10	I_11	I_12	I_13	I_14	I_15	I_16	I_17	
p value	0.001	0.594	0.000	0.561	0.040	0.519	0.425	0.014	

Source: own processing

All these factors cause differences in the process of talent management. Existence of HR unit, foreign capital, and economic situation determined nine searched items. And the last factor size of the company determined 8 items. When we look to our hypothesis, all of them were confirmed (see table 10).

Table 10: Summary of hypothesis confirmation

Hypothesis	Item	p values	Confirmation (yes or no)
H1	item 2	0.000; 0.000; 0.017; 0.000	yes
H2	item 3	0.000; 0.000; 0.011; 0.002	yes
H3	item 8	0.000	yes
H4	item 9	0.010	yes
H5	item 14	0.019	yes

Source: own processing

4. Conclusion

We examined relationships between determinants (size of the enterprise, foreign capital, economic situation, and existence of HR unit) and phases of the talent management process representing by some special activities (17 items). This research contains 288 enterprises of Slovakia. There were some interesting findings identified as a results of our research. We can conclude that the strategic approach of talent management process represented by human resources strategy, and by talent management strategy is determined by the all selected factors (size of an enterprise, foreign capital, economic situation, and HR unit). There is statistically significant difference in carrying out of special activities focused on talent acquisition between enterprises with and without HR unit. The assessment of the talents representing by

special reward system is determined by the economic situation of the enterprise. Level of sufficient financial resources for talent development is determined by the foreign capital allocated in the enterprise.

We identified only the existence of difference, so there are some limitations of our research. The ambition of the team is to continue with this research and find more interesting findings. We would like to examine if the strategy of talent management is more often and formulated on higher quality level in small, medium or large companies. Then we would like to test if it is true that better support activities for talent individuals could be seen in companies with allocated foreign capital. Other possible question for further research is connected with success in talent retention process if it is more successful in companies with better economic situation, because we consider that companies with better economic situation have better opportunities to retain talented individuals who are motivated with higher salary.

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Applying Markowitz portfolio theory to measure the systematic risk in agriculture

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Abstract
Markowitz portfolio theory is the basic theory in Finance for portfolio diversification. Based on this theory market risk can be assessed. The paper uses the alternative Markowitz portfolio theory approach, by replacing the stock return with return on equity (ROE), to estimate the risk and profitability of unquoted agricultural farms. The development of risk and return of Slovak farms is estimated in the period of years 2000 – 2013, using the 5-years moving average. The portfolios are created for two types of production: crop farms and animal farms. The results show that from the point of production orientation, the crop farms record higher return and also higher risk in comparison to the animal farms. The development of risk and return reflects the structural changes in Slovak agriculture, which has been continually changing in the way of increasing the share of crop oriented farms.

Key words: *Agriculture, Markowitz portfolio theory, production orientation, return, risk*

JEL Classification: *Q32, Q38*

Introduction

After 1989, Slovak agricultural sector was transformed from centrally planned economy to the market economy. Fundamentally, this process was based on privatization, the transformation of co-operatives, which meant co-op owned assets were divided into individual property shares and then allotted to co-op members and other eligible persons, and the reinstatement of former owners (Blaas, 2000). Before 1989, Slovak agriculture consisted of cooperatives only and state farms with large acreage, without existence of private companies. Since that time the number of private companies (Joint Stock Company (JSC.), Limited Liability Company (Ltd.)) has been gradually increasing, because this type of legal form is considered to be more effective. (Pokrivčák et al, 2005). During this period agricultural production decreased and in this way adapted to a domestic demand influenced by the lower purchasing power of population and by changes that occurred in the structure of consumption and in consumer behaviour of the population. Since the year 1995 the level of production has stabilised. Accession to European Union (EU) became the most significant factor influencing agricultural policy. The year 2004, when we adopted Common agricultural policy and farmers received their first direct payments, became a next milestone in the development of Slovak agriculture. Since that time the expectations led more profitable, growing, more efficient and competitive agricultural sector, that would also contribute to the economic growth of other sectors of the economy of Slovakia. However, new political regulations, quotas, requirements and single payment system led to the number of substantial changes that have been ultimately impacting economic development in this sector and priorities of farmers. In the years 2003, 2007 and 2009 agricultural production, and in particular crop production, was affected by extraordinarily dry weather, which influenced total agricultural production and the economic situation of farms. Not only the legal structure has been changing, but also the crop production has been year to year on the increase (except of year 2009), while the animal production has been in general decreasing. Therefore, we decided to examine the changing

structure of Slovak agriculture with the focused on riskiness and profitability of Slovak farms, according to their legal form and production orientation.

Risk generally refers to deviation of the evaluated indicator, and the level depends on the volatility over a certain period. Risk in agriculture has been a matter of worldwide concern since 1933, when the concept of risk analysis had been introduced (Hardaker et al, 2004). Agriculture is a sector facing particularly large risks, resulting mainly from natural factors outside the control of farmers. The resulting variations in farm output, combined with a relatively low price responsiveness of supply and demand, also cause agricultural markets to be rather volatile (Tangermann, 2011). The sources of risks, that are relevant in agriculture have different characteristics, and can be classified in very different ways (Huirne et al, 2000; Holzman and Jorgensen, 2001). Sources of risk of Slovak agriculture include biological nature of production, dependency on climatic conditions, seasonality, animal and plant health, prices instability, policy regulations, and range of macroeconomic factors (Serenčéš et al, 2010).

There have been several approaches to measure agricultural risk resulting from different focus of authors. Some of them are focused on agricultural risk of individual farms, others took into account the whole aggregate level (El Benni and Finger, 2013; Špička and Vilhelm, 2013, Just and Pope, 2003). Because farms can be thought of as assets within an overall portfolio, agricultural producers also paid attention to the concept of diversification and portfolio theory. In the Markowitz portfolio theory, total risk is standardly measured by the mean-variance model and standard deviation of stock return (Markowitz, 1952). But, not all businesses provide the ability to raise their capital in the form of stocks. These businesses represent unquoted companies, to which the majority of agricultural companies belong. The stocks, considered in the original model, represent the equity securities, and the return on stock reflects simply the return on equity invested into the business. Therefore, it might be assumed that to be able to measure the risk of unquoted companies, the deviation of return on equity could be considered, as well. In order to focus on other than security market the alternative of Markowitz theory approach, the Simple index model, was created (Sharpe, 1963). In SIM the input variables used in analysis are the accounting fundamentals of companies. SIM approach was applied in the number of studies, such as usage of gross and net returns (Gempesaw et al, 1988), farm equity returns (Baginski and Wahlen, 2003), book to market ratios (Fama and French 1995) or cash flow variability (Cohen et al, 2009; Da, 2009). It empowers our assumption to measure the market risk of unquoted farms, using the return on equity ratio ROE.

The risk analysis of agriculture, using the Markowitz approach or Single index model, has been applied to a number of studies, however many of them did not have aggregate character. They mainly focused on the certain part of agriculture production, for example, Peterson and Leuthold (1987) used the portfolio approach to examine the cattle feeding problem, Sanchirico et al (2005) use portfolio theory to develop optimal management of fisheries, Gempesaw et al. (1988) applied the model to Delaware farm sector market portfolio or in more recent study Libbin et al (2004) applied the Markowitz portfolio model directly to a series of New Mexico farms. Many other studies could be mentioned, because the range of applications is really wide. Similarly, we decided to focus our study on examining market risk and return of Slovak agriculture sector and its development over the time. All the farms operating in Slovakia were included into several portfolios, according to the legal form (cooperatives/companies) and production orientation (crop/animal). The main objective of the paper is to estimate the development of market risk and return of Slovak unquoted agricultural farms over the period 2000 – 2013, using volatility of ROE. This paper is the extension of our previous study (Tóth et al, 2014).

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Material and Methods

The data used for the analysis are from the database of Ministry of Agriculture and Rural Development of the Slovak Republic, over the period 2000 - 2013. For our analysis, data were selected according to the production orientation to the subset of crop farms and animal farms. The selecting criterion for production orientation was the percentage share of revenues from crop production, or revenues from animal production from the overall revenues from own products and services. When the farm generated more than 50% of revenues from crop production, it was determined to be crop farm. Analogically, the selection was done for animal farms. To avoid the deterioration of results and trend in data, the 5-years moving averages were used. It divided our overall observed time horizon into 10 periods (2000-2004, 2001-2005, 2002-2006, 2003-2007, 2004-2008, 2005-2009, 2006-2010, 2007-2011, 2008-2012, 2009-2013). Moreover, from the dataset the following farms were excluded: farms that started or quitted during each observed 5 year period, farms with negative equity (liabilities exceeding total assets) and farms with return on equity (ROE) exceeding +/- 100% (average profit or loss exceeds equity) over the observed period. The number of farms used for calculation in each 5-year period are described in the table 1.

The modified Markowitz portfolio theory approach was used to estimates the total risk of five portfolios consisting of all agricultural farms, capital companies, cooperatives, crop farm and animal farms. We assumed that the return of the investor is based on the profit of the company and the equity invested. Therefore, we considered return on equity ROE (Eq. 1) to be equivalent to the return on stocks, generally used in the case of quoted companies. Measuring volatility of return in the Markowitz portfolio theory is based on the average return over the observed period for each investment. We calculated the average return on equity EROEi (Eq. 2) for each individual farm.

$$ROE_i = \frac{Earnings\ After\ Taxes}{Sharesholders\ Equity} \tag{1}$$

$$EROE_i = \sum_{i=1}^{t} ROE_i \cdot d_i \tag{2}$$

Where ROE_i is return on equity of farm “i”, d_i is a weight of ROE_i over the observed period (5 years, di = 0.20), t is number of years in observed period, i, j are individual farms. The individual risk of each farm (σ_i) is calculated using the standard deviation.

$$\sigma_i = \sqrt{\sum_{i=1}^{t} (ROE_i - EROE_i)^2 \cdot d_i} \tag{3}$$

Where σ_i is standard deviation of the individual return on equity (individual farm risk), ROE_i is individual return on equity, $EROE_i$ is average individual return on equity.

The portfolio risk (σ_p) is determined by three variables: weight of the individual investment in portfolio (w_i),standard deviation of the individual investment - individual risk (σ_i), and covariance, relation between the ROE_i and ROE_j (σ_{ij}). To take into account market portfolio of all agriculture farms, the weight wi of each farm is determined by farm market share, which is the share of the farm` s equity on the total equity of all farms.The covariance represents the

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relationship between returns on equity of farms (Eq 4) and Σ covariance matrix (Eq. 5). The portfolio risk is then measured according to eq. 6

$$\sigma_{ij} = \frac{1}{n}\sum_{i=1}^{n}(ROE_i - EROE_i)(ROE_j - EROE_j) \tag{4}$$

$$\sum = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} & \dots & \sigma_{1k} \\ \sigma_{21} & \sigma_{22} & \sigma_{23} & \dots & \sigma_{2k} \\ \sigma_{31} & \sigma_{32} & \sigma_{33} & \dots & \sigma_{3k} \\ & & \dots & & \\ \sigma_{k1} & \sigma_{k2} & \sigma_{k3} & \dots & \sigma_{kk} \end{bmatrix} \tag{5}$$

$$\sigma_p = \sqrt{\sum_{i=1}^{n} w_i^2 \cdot \sigma_i^2 + \sum_{i=1}^{n}\sum_{j=1}^{n} w_i \cdot w_j \cdot \sigma_{ij}} \tag{6}$$

Where w_i is an individual weight of i-farm (farm`s equity) in a portfolio (total equity of all farms) and n is number of farms.

The expected return on equity of portfolio is estimated by the multiplication of k x 1 vector of individual weights of portfolio (w) and k x 1 vector of corresponding individual expected returns on equity (the sum of multiplication of each farm´s expected ROE and its share in the market portfolio).

$$EROE_p = \sum_{i=1}^{n} EROE_i \cdot w_i \tag{7}$$

Where $EROE_p$ is expected portfolio return on equity and $EROE_i$ is the average return on equity of individual farm.

Results and Discussion

The first part of the paper focuses on the changing structure of Slovak agriculture, from the point of the use of utilized agricultural land and legal forms in agriculture. The structural changes result from the economic situation of farms, their profitability and risk. In the second part of the paper the risk and return of Slovak farms is estimated, with the more detailed view on legal forms and production orientation of farms.

Structure of Slovak Agriculture

The business structure of agricultural primary sector consists of wide range of business entities, which number, use of cultivated area and size has been constantly changing. In the year 2014 the total number of farms was 17 708, which together operated on 1 883 220 ha of utilized agricultural area (UAA). It represents only 52% of known owners of agricultural land, consisting of 43.5% individuals, 4.5% firms and 4% state-owned land. The rest of the agricultural land of unknown owners is temporally administrated by the Slovak Land Fund (SPF) and the users of the land pay a rent.

From the point of the size of the farm (the utilized agricultural area size), is structure of farms in Slovakia different compared to the EU average. It results from the historical development of agriculture in former Czechoslovakia before 1989. Nowadays, the majority of UAA (74.64% in 2014) is cultivated by large farms with over 500 hectares, while the UAA per farm in the EU is much lower. Therefore, also measures implemented through CAP result different

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in Slovakia. The division of the farms and their percentage share on the total utilized agricultural area is shown in Table1.

Table 1. UAA per farm as a percentage of total area

Years	Category of the Utilized Agricultural Area						
	0-5 ha	**5-10 ha**	**10-50 ha**	**50-100 ha**	**100-250 ha**	**250-500 ha**	**over 500 ha**
2010	0.99	0.94	3.43	2.91	6.8	7.91	77.74
2011	0.99	0.95	3.75	2.95	6.42	8.20	76.75
2012	0.99	0.98	3.97	2.94	6.60	8.28	76.24
2013	1,01	1,04	4,23	2,97	7,04	8,21	75,49
2014	1,04	1,09	4,52	3,1	7,07	8,55	74,64

Source: Data of the Agricultural Paying Agency of Slovakia (2015).

Since 1989 the former socialist cooperatives and state-owned companies have been transformed into private business companies and co-partner cooperatives. The number of independent farmers in the primary sector increased in the first years of the transformation and then stabilised. Structural changes, which had been carried out in Slovak agriculture have led to a decrease of the share of cooperatives on the total number of farms, and to an increase in the number of business companies. In the year 2014 were recorded 2082 private companies (1968 Ltd. and 119 JSC.), and only 566 cooperatives. In comparison to the year 2010 the share of cooperatives decreased by 2.25%, share of joint-stock companies increased by 9.17%, and share of Ltd. increased by 50.23%. Moreover, we can observe the irregular nature of Slovak agriculture, where a minority of farms (14.98 %) owns the vast majority (80.23 %) of the agricultural land (Table 2). In absolute terms, 2653 agricultural holdings farmed 1,4 million hectares of agricultural land in 2014. This phenomenon was also observed in the Czech Republic, although in Slovakia it was more prominent. This distribution of land, with many small farms sharing a low percentage of agricultural land and a few large holdings farming the vast majority of the UAA, explains the very high average area per holding registered in Slovakia. Large farms generally rent the land and therefore significantly influence the rent and land price. According to the Eurostat, in Slovakia 89% of the land in 2007 was rented (in 2005, 96%). Unfortunately, the situation has not been changing in recent years. For example in the year 2007 only 11,2% of farms owned 81% of agricultural land, and in 2010 year 12.5% of farms owned 80.38% of agricultural land.

Table 2. Size structure of Slovak farms

	Number of farms		Index	UAA 2014		
Legal form	**2010**	**2014**	**Change (%)**	**Land (ha)**	**Land per farm**	**Share on all farms (%)**
Joint stock company	109	119	9,17%	13272,01	1 113,21	0,67
Cooperative	579	566	-2,25%	691 054,33	1 220,94	3,2
Small – family farm	9020	9 785	8,48%	53 291,14	5,45	55,26
Ltd.	1310	1 968	50,23%	687 429,45	349,3	11,11
Farmers	4774	5 046	5,70%	303 866,73	60,22	28,5
Other	146	160	9,59%	12,383	n.a.	0,97
Total	15938	17 708	11,11%	1 883 220,05	n.a.	100

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Source: Data of the Agricultural Paying Agency of Slovakia (2015).

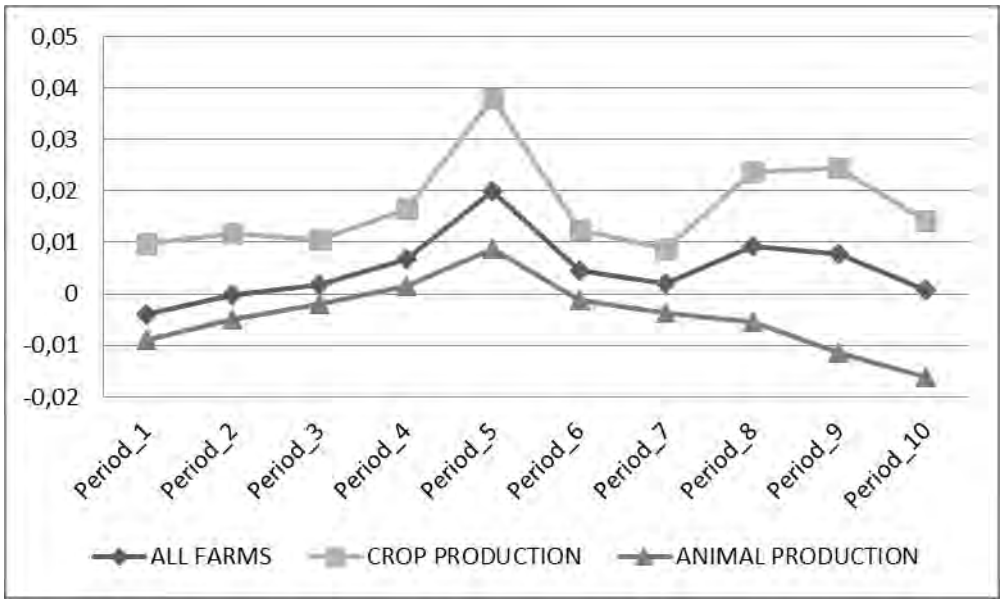
The structural changes can be also explained by the results of the economic development of farms in recent years. Therefore, in the second part of the paper the profitability and riskiness of farms have been estimated.

Risk and return of Slovak farms

For the risk assessment were used all agricultural farms operating at least 5 consecutive years, that includes 785 farms each year on average. All the farms are divided based on their production orientation (crop and animal farms). From the structure of samples in each period is obvious, that the number of cooperatives is continually decreasing, while the amount of companies is on the increase. The same trend can be seen in the case of production orientation, with the increasing amount of crop farms and decreasing animal farms (Tab.1). It means that the structure of the Slovak agriculture has been gradually changing in favour of companies (JSC, Ltd) focusing on crop production.

The portfolio return is measured by individual ROE and the weight of each farm in each portfolio. Generally is claimed that the higher the return, the better for the investor. We can conclude that overall profitability in the Slovak agricultural sector is at the low level. From the comparison of crop and animal farms is obvious that the differences of return in individual period are small. Production is very closely related, and therefore their development trends are similar as well. However, the return of crop farms in each period is positive, while the animal farms are suffering loss. The exception is the period 5 (2004-2008). It is subjected to the "before crisis year" 2008, when not only the agricultural production was very favourable, but also the prices of agricultural commodities reached their maximum.

Figure 1. Return of portfolios of crop farms and animal farms



Source: own processing

Risk of portfolios was estimated using portfolio theory approach, with the measured volatility of ROE. This offers an aggregate view on risk of all farms. By adding all farms existing over the observed periods in the appropriate weight to a portfolio, we simulated the situation what risk investor would face by buying all the farms in agriculture for the price equal to their total equity. We can see (Fig.2) the results in each period. The risk of all farms varied between 1 to 3.61% of ROE. In the case of crop and animal farms the difference in risk is more visible. It results from the production character and the fact that crop production is more dependent on the climate and the amount of rainfall received during the cropping season (Hurley, 2010,

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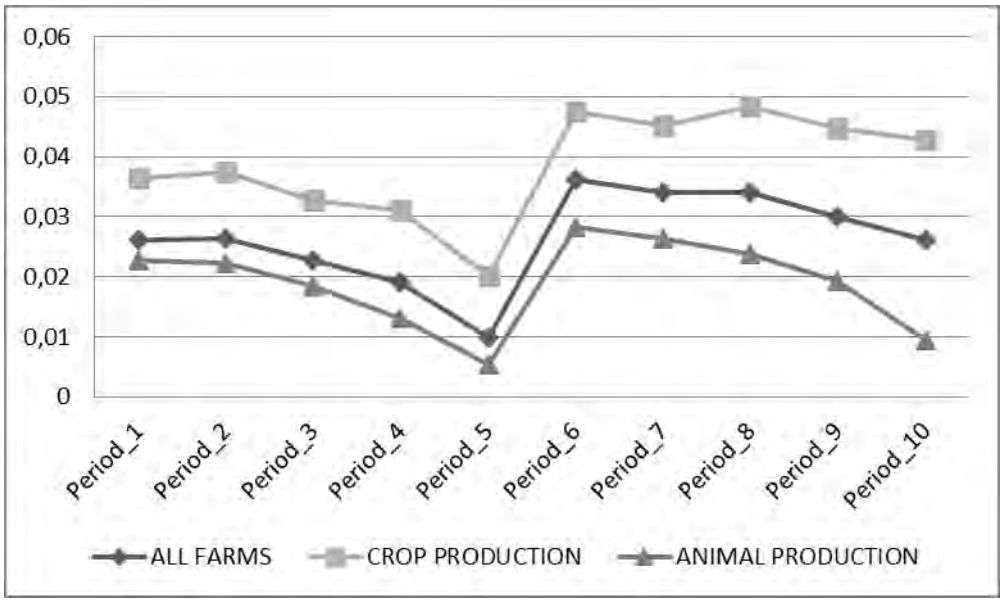
Hardaker et al, 2004). The animal production is considered to be long-run and therefore more stable in comparison to crop planting usually with 1-year production cycle.

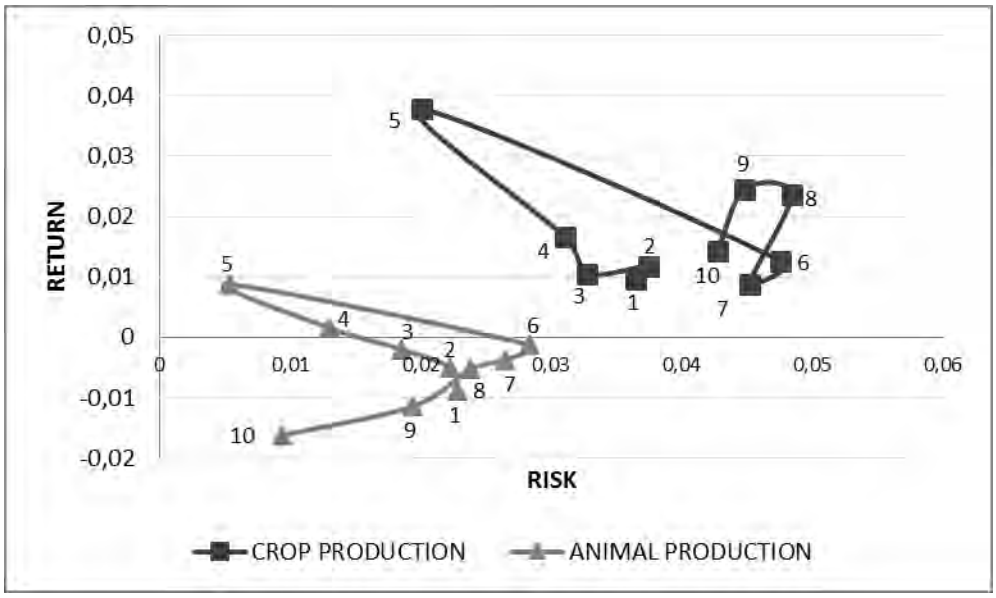
Figure 2. Risk of portfolios of crop farms and animal farms



Source: own processing

In all cases there is a significant change in riskiness between period 5 and 6. It is reasoned by the deviation in the year 2009, when the majority of farms generated loss. Not only the 2009 was the crisis year, what pushed the prices of agricultural commodities down, but also the climate conditions were unfavourable and the production suffered by drought. These facts caused the increased volatility of returns and production.

Figure 3. Return vs. risk: crop farms, animal farms



Source: own processing

The relationship between risk and return for each portfolio (Fig.3.) is important for investors. In the theory, the higher return requires higher risk. In the situation of equal risks the investment with higher return should be preferred and conversely, when returns are equal investor should prefer lower risk. This statement leads us to conclusion, that the agriculture producers should prefer the crop production orientation.

Conclusion

Farmers faced variety of risks that originate from different sources. These risks are very rarely completely independent from each other, particularly when measured in terms of their impact on the income variability. Concern on increasing farm income volatility in the EU has induced wide range of research in this area. Only a few studies paid attention to the issue of risk in agriculture in Slovakia, therefore we decided to focus our research on this area. The risk in the European agriculture is decreased by Common Agriculture Policy in form of subsidies and regulations. The difficulty to measure the risk of agriculture companies results from their unquoted character. The majority of farms in agriculture are unquoted, meaning to assess the market value for return and risk calculation has to rely on financial statements. One of the negatives is that these statements are used for tax purposes, and therefore can be adjusted in sense of tax.

In the first part, the paper is focused on the structure of Slovak agriculture. From the point of the utilized agricultural area size, structure of farms in Slovakia is different when compared to the EU average. The majority of UAA (74.64% in 2014) is cultivated by large farms with over 500 hectares, while the UAA per farm in the EU is much lower. Structural changes, which had been carried out in Slovak agriculture have led to a decrease of the share of cooperatives in the total number of farms, and to an increase in the number of business companies. In the Slovak agriculture the specific phenomenon is observed, where a minority of farms (14.98 %) owns the vast majority (80.23 %) of the agricultural land. This distribution of land, with many small farms sharing a low percentage of agricultural land and a few large holdings farming the vast majority of the UAA, explains the very high average area per holding registered in Slovakia. Large farms generally rent the land and therefore significantly influence the rent and land price. Moreover, this situation has not been changing in recent years. The structural changes can be also explained by the development of profitability and riskiness of farms in recent years.

In the second part, the paper focuses on the estimation of the development of risk and return of Slovak unquoted agricultural farms over the period 2000 – 2013. For the measurement is used the alternative Markowitz portfolio theory approach, where the return of stocks is replaced by the volatility of ROE. Not only all existing farms in ten 5-years periods were examined, we focused specifically on two production orientations (crop and animal farms). It can be concluded that from the point of production orientation, the crop farms record higher return, and also higher risk in comparison with the animal farms. It agrees with the general opinion that the crop production is riskier than the animal production, because of the dependence on climate and production cycle. Similarly, there has been a gradual increase of the amount of crop oriented farms and decrease of the animal farms. One of the reasons for this development is the CAP single payments system. We expect that in the future the structure of Slovak agriculture will change in the way of increasing percentage share of crop oriented private companies.

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Determinants of efficiency in agriculture in CEE countries

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Abstract
Based on selected data acquired from Eurostat database the output efficiency of agriculture in CEE countries at national level is evaluated. DEA approach is applied in order of Malmquist productivity index calculation. Analysis includes one output variable (Total Agricultural Output) and three input variables (Total Labour Input, Total Utilized Agricultural Area and the Consumption of Inputs). In addition, the paper identifies the variables (average farm size, average subsidies per farm and education of managers in agriculture), which affect technical efficiency in agriculture.

Keywords: *CEE, DEA, Malmquist productivity indices, Total Factor Productivity*

JEL Classification: *D24, Q10*

1. Introduction

Efficiency analysis can be applied in the level of countries, as well as at the level of selected industries. Agriculture has been one of the most important sectors of national economy in the most countries of the world or at least the sector with the longest history. Its importance among European countries is highlighted by the policy framework of Common agricultural policy (CAP), which is aimed on rural and agricultural development. CAP has been working toward the modernization and sustainability of the sector since 2008.

1.1 Literature review

The paper points out the researches which conducted a research of the performance of agriculture in individual countries through the common performance indicators, the Technical Efficiency (TE) and Total Factor Productivity.

Serrão (2003) examined the sources of productivity growth and the productivity differences among countries and regions over the period 1980-1998. Research included fifteen European Union countries and four East European countries. The study was based on data collected from the Food and Agriculture Organisation of the United Nations. An approach based on Data Envelopment Analysis was used to provide information on the peers of the (inefficient) country and to derive the Malmquist productivity indices. Author claimed an annual growth in Total Factor Productivity of 2.2 percent, where a major contributing factor was technical change. Negative growth in efficiency change was observed in a couple of years. France posted the most spectacular performance, with an average annual growth of 3.6 percent in Total Factor Productivity over the observed period. Bel-Lux and Denmark had a similar performance. Portugal posted a Total Factor Productivity growth decline. Turning to the performance of the five European regions defined in his research work, the Eastern European region (consisting of Romania, Bulgaria, Poland and Hungary) was the major performer, with an annual Total Factor Productivity growth of 2.6 percent. Akande (2012) measured the Technical Efficiency and TFP growth of agricultural holdings in the EU-15 region over the 11 years period by Data Envelopment Analysis. Author observed an average technical efficiency of 87% for the EU-15 region as a whole. Author divided the EU-15 region into four regional groups. Western

European Region was more efficient with the highest average technical efficiency of 95% while Central European Region shared the same technical efficiency level of 85% with Southern European Region. Meanwhile, the Northern European region was the least technically efficient (84%). The annual average of 3% and 4% TFP growth rate was observed for all the regions in the EU-15. Study observed that TFP growth rate in the four regional groups were being driven by technology progress (technical change) and a decline in efficiency change particularly between the years 1999 and 2002. Subsequently up till 2005, the growth rate was driven by catch-up (efficiency change) while there seem to be technological regression. Fogarasi (2006) analysed efficiency and TFP in Hungarian sugar beet production. For 2004 and 2005 efficiency and TFP were calculated by Data Envelopment Analysis and by a Malmquist index respectively. Between 2004 and 2005 the average technical efficiency was very stable, around 0.80 for CRS efficiency and 0.87 for VRS efficiency. Between years TFP increased by 9%. The main reason for the observed TFP increase was technical progress of 8%, while technical efficiency played a limited role in improving the performance of sugar beet production. At the same time there was a clear convergence which can be identified and thus improving efficiency scores among individual holdings. Coelli et al. (2006) obtained detailed information on the TFP growth of arable farms in Belgium over a 16 years period from 1987 to 2002. The TFP measures were calculated using a Malmquist indices and DEA methodology. The results indicated an average annual rate of TFP change of 1.0% per year, with most of this being due to technical change. An inspection of the TFP change indices before and after the two CAP reforms (in 1992 and 2000) indicated that these reforms had had no discernible effect upon TFP trends.

Following authors conducted a research based on various econometric models to calculate and evaluate the significant drivers of efficiency in agricultural sectors among the studied economies. Authors considered direct investment into agriculture, subsidies, inputs quality, openness of the country and farm size as significant drivers of efficiency.

Nowak et al. (2015) concerned the measurement of the technical efficiency of agriculture in the 27 European Union countries in 2010. The research was conducted based on the output-oriented DEA method assuming variable returns to scale. Moreover, in the study, the factors affecting technical efficiency were identified, and the econometric modelling of their impact was performed with the use of the Tobit model. Authors claimed that across the 27 EU Member States, the level of the technical efficiency of agriculture was diverse and the difference between the states with the highest and the lowest efficiencies was 40%. Cyprus, Denmark, Greece, France, Spain, the Netherlands, Luxembourg, Italy and Malta were identified as the countries with the thoroughly technically efficient agriculture. In turn, the least technically efficient agriculture was observed for the Czech Republic, Lithuania, Hungary, Ireland, Latvia and Slovakia. Authors considered the soil quality, the age of the head of the household and the surcharges for investments as main determinants of agriculture in observed countries. Domanska et al. (2014) measured the agricultural total factor productivity change in 27 European Union countries. The analysis included the years 2007 2011 and the research was conducted based on Malmquist productivity index completed with decomposition on technological changes and technical efficiency changes. In addition, the determinants of total productivity were identified in the study, and econometric modelling of their effect on TFP was conducted using Tobit model. The study demonstrated a small increase in agricultural TFP for the whole sample of 27 EU countries over the examined period. The reason of this increase was mainly the changes in technical efficiency. An effect of technological changes was in turn relatively low and of negative character. The analysis of the factors determining TFP changes demonstrated that factors like: percentage of farm managers with complete agricultural education, average farm area and economy openness measured as a ratio of total export to total import were the stimulants. In turn, the variable like the share of farm managers aged above 55

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years appeared to be dissimulated. It is worth to emphasize that soil quality, additional payment to investments and number of students' in agricultural and related fields of study was insignificant from the total productivity changes point of view. Economic performance of European farms is strongly dependent on subsidies and public supports in form of direct payments. In fact there are some countries like Finland, Slovenia and Slovakia where the sum of total subsidies is greater than agricultural value added. According to Matthews (2014) those are the countries in which the agriculture does not add anything to GDP and farming is a pure consumer good financed by the taxpayer in return for the non-economic values. Bojnec and Latruffe (2013) investigated the links between size, subsidies and performance for Slovenian farms over the period from 2004 to 2006. Authors' analysis revealed that both pre- and post-accession farms' performance measured in terms of technical efficiency was positively related to farm size in Slovenia. Authors also found that small farms are less technically efficient but more allocative efficient and profitable. The persistence of small farms in Slovenia may be associated with the provision of generous subsidies, which was negatively related to farms' technical efficiency but positively related to their profitability. Latruffe et al. (2008) analysed the impact of public subsidies on farms efficiency in EU new member states before and after accession to the European Union. Four countries were considered: Hungary, the Czech Republic and Slovenia, who acceded to the EU in 2004, and Romania, whose accession was in 2007. The study found that subsidies had a negative impact on farm technical efficiency in Hungary over the period 2001-2005, in the Czech dairy corporate sector over the period 2000-2004, in Slovenia over the period 1994-2003, and in the Romanian crop sector in 2005.

2. Data and Methods

Model works with one output – output of agricultural industry for each country in millions EUR. This output is produced as a result of set of inputs. Land in form of utilized agricultural area (UAA) measured in 1000 ha, employment in sector of agriculture in 1000 persons and consumption of inputs are considered while calculating TE and TFP. Consumption of inputs involves data on the amounts of seeds and reproductive material, energy and lubricants, fertilizers and soil improvers, crop protection products and pesticides, veterinary expenditures, animal feed, maintenance of machinery, maintenance of buildings, agricultural services, other products and services. Consumption of input is measured in millions EUR. We used aggregate data gathered from the EUROSTAT database. For the calculation of Malmquist index the Stata 12.0 statistical program was used.

Table 1 describes the descriptive statistics of the data used. The vast variation of variables was found.

Table 1: Descriptive statistics of the data

Variable	Obs	Mean	Std. Dev.	Min	Max
TAO	60	5909.89	6614.78	569.75	23198.35
UAA	60	5119.52	5047.26	468.50	16177.10
EMP	60	573.74	899.12	19.29	2814.56
C_INP	60	3695.79	3910.84	391.50	14185.05

Note: TAO – Total Agricultural Output, UAA – Utilised Agricultural Area, EMP – Employment, C_INP – Consumption of inputs
Source: own processing based on Eurostat data

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2.1. Data Envelopment Analysis

The employment of DEA models enable to measure efficiency involving multiple inputs and outputs. It is based on seminal work of Farrell (1957) and it is a non-parametric approach toward efficiency measurement using linear programming, accounting for multiple outputs and inputs. These models can be constructed either as output oriented (maximization) or input oriented (minimization). Input-oriented models refer to the amount by which all inputs could be proportionally reduced without a reduction in output, while output-oriented models answer the question by how much can output quantities is proportionally expanded without altering the input quantities (Coelli, 1995). Uses of input or output oriented model provide similar values under constant return to scale but are unequal when variable return to scale is assumed.

In the case of efficiency we employ output-oriented model with CSR in form:

$$\begin{gathered} max_{\varphi,\lambda\varphi} \\ -\varphi y_i + Y\lambda \geq 0 \\ x_i - X\lambda \geq 0 \\ \lambda \geq 0 \end{gathered} \tag{1}$$

where φ is efficiency rate for each decision-making unit (DMU, CEE state in this case), λ refer to linear combination of inputs and outputs, Y is vector of outputs and X vector of inputs. The condition λ≥0 indicates CSR.

2.2. Malmquist productivity index

Malmquist index is used to compare the development of agricultural performance over the time periods. It is the measure of productivity change and it decomposes this productivity change into technical change and technical efficiency change (Coelli, 1995). Malmquist productivity index is a geometric mean of two production functions based on the distance functions, as follows:

$$M_0(y_{t+1}x_{t+1}y_tx_t) = [\frac{d_0^t(y_{t+1},x_{t+1})}{d_0^t(y_t,x_t)} \times \frac{d_0^{t+1}(y_{t+1},x_{t+1})}{d_0^{t+1}(y_t,x_t)}]^{1/2} \tag{2}$$

which can be further adjusted to:

$$M_0(y_{t+1}x_{t+1}y_tx_t) = \frac{d_0^{t+1}(y_{t+1},x_{t+1})}{d_0^t(y_t,x_t)}[\frac{d_0^t(y_{t+1},x_{t+1})}{d_0^{t+1}(y_{t+1},x_{t+1})} \times \frac{d_0^t(y_t,x_t)}{d_0^{t+1}(y_t,x_t)}]^{1/2} \tag{3}$$

where the outputs and inputs are y_t,x_t in the basic period, y_{t+1},x_{t+1} are output and output in the next period. Notation d_0^t and d_0^{t+1} represents distance of the DMU in the basic and next period. The resulting product of Malmquist index (M_0) is change in productivity. It includes change of technical efficiency and technological change. Whenever the M_0 >1 it signalizes the enhanced productivity.

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3. Results and Discussion

Following results was based on the calculation of Malmquist indices across CEE countries. The survey was conducted in the period from 2007 to 2012. First, we calculated the output efficiency scores under CRS (Constant Returns to Scale). The score higher than 1 indicates, the DMU is inefficient relative to the other DMUs. As you can see in table 2, the average efficiency score in CEE countries (2007-2012) was 1.0545 which shows, that if countries tend to be effective, they have to increase they output in average by 5.45 % (by the constant primary input level) to be efficient. Furthermore, the output efficiency scores varied across CEE countries and in the investigated period, as well, but they were relatively close to the level of average CEE efficiency score. The most efficient countries were Hungary, Romania and Slovenia with efficiency score 1.0000 and the least efficient countries were Latvia (1.2117) and Slovakia (1.1005). The best performer country during the period was Slovakia, which efficiency score in 2007 was 1.1812, while the efficiency score in 2012 was 1.0000, which indicates that Slovakia became effective relative to other countries.

Table 3: Efficiency Scores

Country	eff_2007	eff_2008	eff_2009	eff_2010	eff_2011	eff_2012	eff_mean
Bulgaria	1.0741	1.0000	1.0000	1.0700	1.0000	1.0733	1.0362
Czech republic	1.1520	1.0854	1.0717	1.0159	1.0854	1.0073	1.0696
Estonia	1.0000	1.0593	1.0003	1.0000	1.0593	1.0000	1.0198
Latvia	1.1532	1.2469	1.1806	1.1726	1.2469	1.2701	1.2117
Lithuania	1.0754	1.1235	1.0522	1.0841	1.1235	1.0000	1.0765
Hungary	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Poland	1.0000	1.0726	1.0193	1.0211	1.0726	1.0000	1.0309
Romania	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Slovenia	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Slovakia	1.1812	1.1280	1.1656	1.0000	1.1280	1.0000	1.1005
Average CEE	1.0636	1.0716	1.0490	1.0364	1.0716	1.0351	1.0545

Note: eff – denotes output efficiency score under CRS
Source: own processing based on Eurostat data

Now, we turn to the decomposition of TFP growth in agricultural sector across CEE countries (Table 3). Malmquist productivity index (change in TFP, tfp_ch) can be decomposed into efficiency change (eff_ch) and technical efficiency change (tech_ch). Average TFP change in CEE region was 0.9914 which indicates a decline in TFP by 0.86 % in average over the observed period. This decline was associated by the decline in efficiency change (0.9946) and also in the decline of the technical efficiency change (0.9968). The best performer countries in terms of TFP change were Latvia (1.0141), Hungary (1.0097) and Bulgaria (1.0078). The least performer states were Slovakia (0.9578) and Czech Republic (0.9667). The catch up effect was observed only in case of Latvia, where the average efficiency change exceeded 1. The increase in the technical efficiency change was slightly up to 1 in case of Bulgaria and Hungary.

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Table 3: Decomposition of TFP

Country	tfp_ch	eff_ch	tech_ch
Bulgaria	1.0078	0.9999	1.0079
Czech republic	0.9667	0.9735	0.9930
Estonia	0.9929	1.0000	0.9929
Latvia	1.0141	1.0195	0.9947
Lithuania	0.9819	0.9856	0.9963
Hungary	1.0097	1.0000	1.0097
Poland	0.9988	1.0000	0.9988
Romania	0.9992	1.0000	0.9992
Slovenia	0.9847	1.0000	0.9847
Slovakia	0.9578	0.9672	0.9903
Average CEE	0.9914	0.9946	0.9968

Note: tfp_ch, eff_ch and tech_ch – geometric mean over the period 2007-2012
Source: own processing based on Eurostat data

Furthermore, we analysed, the common determinant of efficiency among efficient DMUs and among inefficient DMUs. We took average utilised agricultural area (a_uaa), average subsidies per farm (a_subs_pf) and the Training of the managers into consideration. Based on Eurostat database, the Training of the managers was divided as follows: i; managers with practical experiences only (pract_e), ii; managers with basic agricultural training (basic_t), iii; managers with full agricultural training (full_agri_t). We divided the countries into three clusters according to their efficiency scores under CRS (CRS_eff) as follows: 1. cluster: CRS_eff=1; 2. cluster: 1<CRS_eff<1.05; 3. cluster: 1.05<CRS_eff. Efficient countries owned in average smaller utilised agricultural area than the inefficient ones and the average value of subsidies per farm was much lower than in the case of efficient countries than in inefficient countries. As the efficiency grow, grow the share of managers with only practical agricultural experiences. The share of managers with full agricultural training was about 15 percentage points higher in inefficient countries than in efficient ones. The efficient countries had common the following: i; small average utilised agricultural area, ii; low value of average subsidies per farm and, iii; high share of managers with only practical experiences.

In terms of output efficiency under CRS we observed comparable results like authors mentioned in the literature review. The agricultural sectors among investigated countries didn't differ rapidly among themselves. We found a slightly decrease in TFP change, efficiency change and technological efficiency change. Average TFP change in CEE region was accounted at 0.9914, so there is a discrepancy between our findings and the findings of the authors mentioned in literature review (Akande, 2012; Fogarasi, 2006; Domanska, 2014). Our findings in case of technological efficiency change are in line with the findings of Akande (2012), who also observed a decrease in technological efficiency change.

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Table 4: Variables of efficiency

Country	CRS_eff	a_uaa	a_subs_pf	Training of the managers (%)			
				pract_e	basic_t	full_agri_t	
Hungary	1.0000	51.78	15439.00	86.00	8.00	5.50	**Efficient**
Romania	1.0000	9.52	1753.67	95.00	4.00	0.50	
Slovenia	1.0000	11.10	8500.67	68.00	24.00	8.00	
Average	1.0000	24.13	8564.44	83.00	12.00	4.67	
Estonia	1.0198	121.65	25658.33	65.00	12.50	22.50	
Poland	1.0309	18.72	5515.50	54.50	23.00	22.50	
Bulgaria	1.0364	30.36	5105.83	96.00	3.50	1.00	
Average	1.0290	56.91	12093.22	71.83	13.00	15.33	
Lithuania	1.0890	46.13	11396.83	69.50	18.50	12.00	**Inefficient**
Czech republic	1.0937	225.79	80567.17	44.00	20.50	35.50	
Slovakia	1.1307	546.38	166547.67	78.50	14.00	7.00	
Latvia	1.1922	70.94	16170.00	63.50	12.00	24.00	
Average	1.1264	222.31	68670.42	63.88	16.25	19.63	

Source: own processing based on Eurostat data

4. Conclusion

The aim of this paper was to evaluate the performance of agriculture in ten CEE countries. We employed output oriented DEA model to calculate efficiency scores of CEE countries. The average efficiency score in CEE countries (2007-2012) was 1.0545. Analysis revealed that the output efficiency scores varied across CEE countries and in investigated period, as well. The most efficient countries were Hungary, Romania and Slovenia and the least efficient countries were Latvia and Slovakia. Furthermore, the Malmquist productivity index was used to measure the change in TFP over the observed period. We found a slightly decrease in the level of TFP, which was associated in regress in efficiency change and in technical efficiency change. The most noticeable increase in TFP change was observed for Latvia, Hungary and Bulgaria. Furthermore, we analysed the common determinants of efficiency among efficient countries and among inefficient countries. We took average utilised agricultural area, average subsidies per farm and the training of the managers into consideration and found that the efficient countries had common the following (in average): i; small average utilised agricultural area, ii; low value of average subsidies per farm and, iii; high share of managers with only practical experiences.

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Decision support tool for replacement heifer management: A strategy comparison

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Abstract
The objective of this paper is to introduce and illustrate the application EkonMOD milk, the decision support tool concept for dairy farm managements. The purpose of this simple web-based application is to assist dairy farms managers to better understand the dynamics of the dairy herd structure and to improve economically sensible decision-making abilities in Slovak conditions. The application firstly helps dairy farmers to calculate the potential production and economic impact of different scenarios at the farm-level, in the terms of alternative what-if analyses comparison. Secondly, it takes into account the farm specific characteristics, unique limitations or weaknesses. The versatility of the core application offers potential use in numerous areas including optimal replacement heifer management or feeding strategies evaluation. When heifers calve at ages greater than optimum, larger inventories of heifers must be maintained in the young female bovine herd. Increasing the age at calving also increases the generation interval, delaying the introduction of genetically superior replacements in the herd. If the annual replacement rate of first lactation cow in the EkonMOD milk tool is set to 35%, and 25 % for remaining stages of lactations in a 300 head herd, a minimum of 170 heifers are needed in the pool, assuming a 4% attrition factor for stillbirths, 100 % dairy cow natality, 5 % mortality of calves. With selection of calves indicator set to 4 %, 50 % ratio of heifers born, heifer selection at 20 %, culled cows that die before disposal set to the value of 20 %, approximately 64 pregnant heifers are needed. For every one month increase in the age at calving over 24 months, the replacement inventory numbers are increasing at a rate of 4.7% in this model. This figure takes into account the inventory of heifers from birth until calving.

Keywords: *age at first calving, replacement heifers, culling rate, decision tool*

JEL Classification: *Q120*

Introduction

A major cost for dairy operations is obtaining a sufficient supply of healthy heifers needed for replacements. The majority of milk producers prefer raising future dairy cows on their own, instead of purchasing replacements. The second alternative may become attractive for some producers, especially in the case of external herd expansion or reorganization of dairy unit according to the farm management decision. Selecting the most efficient source of replacement heifers has important implications for optimal resource management, profitability and sustainability of dairy operation, when reflecting the global milk price volatility, ongoing structural changes and geographical relocation in the most productive regions at both, European union and world level. Key factors to consider when determining an optimal herd replacement strategy include financial market indicators, feed costs, labor costs, reproductive rates and specific limitations and business plans of a unique dairy operation. Evaluation of all inputs and outputs relevant to the raising process, with respect to the biological nature of the production and environmental restrictions, can help to determine the optimal rearing strategy and consequent breeding goals. Considering these circumstances will determine the difference between profit and loss in selected period of time. Therefore, producers must be flexible and able to modify herd replacement strategies as needed to

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take advantage of changing conditions. One of the biggest expenses incurred on the dairy is replacement heifer rearing. The feeding costs during this nonproductive life represent the fixed costs for dairy operation and may account for up to 20 % of the total farm expenses (Bailey et al.) Feeding schemes for dairy cattle should be specifically formulated for weight gains during strategic time periods of development, but over-feeding prior to puberty can be detrimental to milk production. In addition to this, the average weight is more critical than age at calving in relation to milk production, therefore replacement heifers can be adequately developed to calve at 24 months, while decreasing expenses and increasing profits (Bailey et al.). Another important management agenda connected to profitability is feed costs optimization. Feed is generally the greatest expense for milk production. With volatility in feed and milk markets, income over feed cost (IOFC) is a more advantageous measure of profit than simply feed cost per cow (Buza, 2014). Optimal feeding strategies related to the unique herd specification represent the key role in efficient and profitable dairy operations. In this paper we reflect on our experiences in developing and delivering management decision tool for dairy farmers in Slovak conditions.

Data and Methods

The application EkonMOD milk, the decision support tool concept for dairy farm managements is used to evaluate the economic consequences of different on-farm strategies. The selected module Number of heifers needed for replacement was developed to raise the awareness about replacement heifer rearing costs and it is used in this paper as a tool to evaluate specific economic and production parameters of a user specified dairy operation. EkonMOD milk is developed in SAP Business Objects Dashboards (version 4.1) and was developed by National agricultural and food centre in Nitra. The core of the application consists of a main Microsoft Excel input and output worksheet, containing basic algorithms and formulas for computing selected farm specific economic and performance outputs. The interactive dashboards are used to illustrate the impact dynamics of the changed variables and they represent the visual add-on to the Excel core application. The tool combines inputs and transforms then into information source - output for farmer by operative construction of economic a production model from individual farm data. The concept builds on user friendly format, with no extra timely demands on farm management. The most of the inputs to the model are easily inserted by sliding bars and filters. The application consists of specific modules focusing on selected key processes on dairy farm. It has a web-page interface to the users, with an idea to spread this approach on all types of animal production present in Slovakia. No input model data would be archived or maintained by the administrator of the dedicated EkonMOD milk tool web page. Once downloaded, no internet connection is needed to running various what-if scenarios against. The idea of constructing this application arises from detailed and long run cooperation with dairy farms in Slovakia, focusing on economic a production analysis, guidance and consultancy. The previous data mining showed a significant difference in dairy operations in terms of scale and number of production units within one single dairy operation. Different husbandry systems, management techniques and number of other individual characteristics connected to the region of production, types of ownership and crop production are present, as well. Development of the tool that can be easily fitted to any dairy farm is being debated with farmers continuously. Number of heifers needed for replacement will be calculated by EkonMOD milk using several herd specific metrics: culling rate indicator (CR) for first lactation cows set to 35%, and 25 % for remaining stages of lactations in a 300 head herd (H), a minimum of 170 heifers are needed in the pool, assuming a 4% attrition factor for stillbirths (SB), 100 %

dairy cow natality (N), 5 % mortality of calves (M). With selection of calves indicator (CS) set to 4 %, 50 % ratio of heifers born (HB), heifer selection (HS) at 20 %, culled cows (CC) that die before disposal set to the value of 20 %, average age at first calving (AFC) 24 months. Average culling rate (ACR) reflects culling rates on first and next lactations. Herd size (H) include first stage lactating cows as well as cows on next lactations. First, heifers needed in replacement pool (HN) are determined by the formula (1), containing the number of heifer from birth till calving in two year period. Finally, deficit or surplus heifer annually to maintain constant herd size (HA) are quantified by formula (3).

$$((H \times ACR) \times 2 \times AFC/24) \quad (1)$$

$$H \times SB \times M \times CS \times HB \times HS \quad (2)$$

$$HP - (HN/2) \quad (3)$$

If this metrics and ratios remain consistent, after one year's time they would have 20 heifers more than what they would need as replacements. This gives them options to increase herd numbers, change culling schemes, or sell surplus heifers on the market. The application offer a graphical interpretation of this formulas and allow to change input variable in the terms of possible or planned on-farm scenarios.

Results and Discussion

Economic efficiency of dairy cattle husbandry depends on the timely and proper utilization of biological fixed assets, namely cows (Genchev and Angelova, 1984). With this regard, the replacement heifer program is particularly important, and its primary goal is to breed these animals at an early age with optimal body weight to achieve easy calving with minimum investments (Fricke, 2004). Dairy farmers face a complex dilemma in minimizing costs associated with rearing heifers while ensuring or enhancing lifetime economic productivity. Decisions about heifer management interact with underlying biological aspects of growth, thereby influencing future profitability of the herd (Mourits et al., 1999). A basic approach to reduce costs is to shorten the nonproductive period of dairy heifers, which can be accomplished by breeding heifers earlier to reduce the age at first calving (AFC; Abeni et al., 2000; Daniels, 2010). Many studies suggest that the optimal AFC is ≤24 mo (Mourits et al., 1999; Gabler and Heinrichs, 2003; Shamay et al., 2005; Stevenson et al., 2008). However, most of those researchers based their conclusions on milk production rather than whole economic measurements. Ettema and Santos (2004) found that only 2.7% of US Holstein dairy farms achieved the recommended targets of AFC ≤24 with liveweights ≥560 kg. The tendency for additional returns from higher number of newborn calves was also confirmed in sheep by Bonev and Kostadinova (2011). Fricke (2003, 2004) proved that the delay in age at first calving in heifers generated additional costs from higher culling rate, dystocia, and metabolic disturbances. According to the author, the optimum age at first calving of heifers was 24 months. Calving heifers at an older age has many disadvantages other than increasing their nonproductive life and delaying potential milk income. When heifers calve at ages greater than 24 to 25 months, larger inventories or numbers of heifers must be maintained in the heifer herd. Increasing the age at calving also increases the generation interval, delaying the introduction of genetically superior replacements in the herd (Bailey et al.). If the annual replacement rate of first

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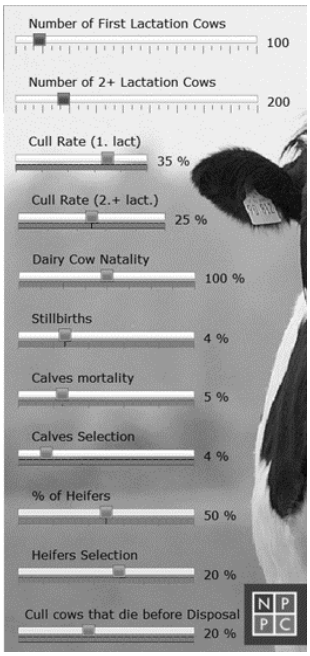
lactation cow in EkonMOD milk toll in Figure 1 is set to 35%, and 25 % for remaining stages of lactations in a 300 head herd, a minimum of 170 heifers in the pool, assuming a 4% attrition factor for stillbirths, 100 % dairy cow natality, 5 % mortality of calves. With selection of calves indicator set to 4 %, 50 % ratio of heifers born, heifer selection at 20 %, culled cows that die before disposal set to the value of 20 % and average age at first calving (AFC) 24 months, proximately 64 pregnant heifers are needed (Figure 2). When calving is delayed to an age greater than 24 months, heifers are accumulating in the replacement pool. For every one month increase in the age at calving over 24 months, the replacement inventory numbers are increasing at a rate of 4.7% in this model. This figure takes into account the inventory of heifers from birth through calving. Therefore, if a herd is calving 28 month old heifers with an average culling rate of first lactation cows 35 % and remaining cows in herd with 25 %, the number of replacement heifers on the farm is now increased from 170 to 199 heifers (Table 1)**.** This equates to 29 additional heifers or an increase of 17 % in the total number of heifers consuming feed, labor, fuel, facilities, and management. The tables below demonstrate the increase in heifers needed at various culling rates (Table 2) and the relationship between the culling rate, age at first calving, and increasing heifer inventory (Table 3). Calving older heifers is subtracting dollars from profitability. Producers should raise only the number of replacement heifers needed, unless the additional heifers will be marketed (Bailey et al.).

Figure 1: EkonMOD milk model calibration



Source: EkonMOD milk screenshot, inputs inserted by author

Table 1: Increased number of heifers needed in replacement pool for each age at calving

Number of Cows in Herd	24 months	26 months	28 months	30 months	32 months	35 months
300 cows	170	185	199	213	227	249

Source: Table adapted from Bailey et al., own calculations

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Note: Total heifer inventory numbers for varying herd sizes at a 35% replacement per year for first lactation cows and 25 % replacement per year for cows at remaining lactation stages. Other rearing parameters are taken from the following assumption: 4% stillbirths, 100 % dairy cow natality, 5 % mortality of calves, selection of calves 4 %, 50 % ratio of heifers born, heifer selection 20 %, culled cows that die before disposal 20 %.

Table 2: Total number of heifers needed per 300 cows for various herd culling rates

Culling Rate	Heifers Needed in Replacement Pool
30	151
33	155
35	159
37	163
40	167

Source: Table adapted from Bailey et al., own calculations

Note: Calving at 24 Months of Age. Other rearing parameters are taken from the following assumption: 4% stillbirths, 100 % dairy cow natality, 5 % mortality of calves, selection of calves 4 %, 50 % ratio of heifers born, heifer selection 20 %, culled cows that die before disposal 20 %.

Table 3 Total heifers needed* in replacement pool

Culling Rate	(Increase in heifer pool numbers over 24 month calving age ^)
30	161 (41^) = 202*
33	167 (42^) = 209*
35	171 (43^) = 214*
37	175 (45^) = 220*
40	181 (46^) = 227*

Source: Table adapted from Bailey et al., own calculations

Note: Increase in heifer replacement numbers for various culling rates in 300 cow herd: First calf heifers calving at 30 months.

The current research indicates an average cost to raise a heifer 1824 € (Michaličková et al.) A herd of 300 lactating cows with a culling rate of 35% will need to calve 88 heifers per 12 months. If the average calving age is 30 months, the increase in expenses is approximately 540 € per heifer for those 6 months over goal. This transforms to 47 520 € loss per year in extra labor, feed and fuel. An additional loss in calving heifers at more than 24 months of age is the increase in heifer inventory numbers (Table 2). If producer A is calving heifers at 24 months of age per 300 cows and producer B is calving at 30 months of age, producer B will have additional heifers in his replacement pool to meet the same culling rate as producer A. The higher AFC accumulates the heifers in inventory. For each additional month over goal of 24 months, 4.7% more heifers are needed in replacement inventory in this model. If producer A needs 171 heifers in his heifer inventory for a 24 month turnover of heifers (from born to calving). Producer B, to meet the same culling rate, will need 214 heifers on his farm. These 43 additional heifers are unnecessarily consuming feed and management (Table 3). Returns from this period down to 24 months could also represent generated income. If the age at first calving is reduced from 30 down to 24 months, the dairy could expect these additional heifers for potential sale, growth, or culling pressure on the lactating herd. This scenario means that in the first two years heifer development is emphasized, expenses in feed and management are decreased by 47,520 € per year, and 53,750 € worth of

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heifers are sold, bringing the total potential income for those two years to 101,270 € (Table 4). Dairymen should not anticipate reducing the age to calving in several months, as experience indicates that it takes at least 18 to 24 months to decrease age at calving to a goal of 24 months (Bailey et al.)

Figure 2: EkonMOD milk result dashboard

Source: EkonMOD milk dashboard screenshot, inputs inserted by author

Table 4: Economic impact of changed input variables

Form for estimating heifer rearing economics for a 300 cow herd:

Cost of raising a heifer to 24 months of age = **1900€**
Cost per Month over 24 months in additional expenses = **90€**
Herd at **35%** culling rate
Herd calving heifers at 30 months
6 months over goal of **24** months
6 months X **90 €** = **540€** per heifer per year
Calving **88** heifers in 12 months @ **540 €** additional cost = **47,520 €**

Transition to reduce age at calving to 24 months of age
Reduced to **24** month age at first calving would need less heifers
See Table 1 (reduce inventory from 213 to 170 heifers or 43 heifers over 2 years) heifers selling for **1250 €**
1250 € X **43** Extra or surplus heifers first and second year = ****53,750 € total over 2 year transition period**

Source: Form adapted from Bailey et al., own calculations
Note: **One time transition recovery of income decreasing from 30 Months to 24 Month. Typically accomplished over a 2 year period of time

Conclusion

The objective of increasing competitiveness and sustainability of dairy farms depends on operative adjusting to the global trends, adapting best practice resource management, calculating price volatility of inputs and outputs and reaching the full production potential of animals with respect to the welfare standards. Detailed analysis of all these factors on day-to-day basis, including possible or considerable situations, represents the key role in every efficiently operating dairy farm management. Keeping the decision making data up to date requires a complex view and understanding the dynamics within the processes and recourses on specific farm. EkonMOD milk demonstrates the effects of changed input variables on heifer replacements requirements based on economic analysis. By indicating the cost of the delay in breeding heifers, the figure provides another evaluation tool for the economics of heifer development. This project gave involved researchers an improved insight in the requirements in the field. Numbers of requests from the dairy farmers have been implemented into the EkonMOD milk tool. The requirement for the model calibration to fit various herd types was communicated with various professionals and specialists

in dairy economics. These experiences are vital for future research and development activities in the field of dairy production in Slovakia.

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Using decision support tool for dairy farm management to assess the economic impact of various feeding scenarios

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Abstract
This paper describes the computer implementation of the decision-making support for dairy operation management. It also aims to improve interpreting the potential impacts of different management decisions on key variables as well as trade-offs, which influence decisions taken at the farm and the feed component level. A baseline, potential management decision scenarios were evaluated and compared as alternative ways of managing the feed requirements of dairy operation. The web-based application EkonMOD milk tool was used to examine the relevant association on the farm-level and to calculate the economic consequences. The purpose of the EkonMOD milk application is to assist dairy farms managers and to better understand the dynamics of the dairy herd structure and to improve economically sensible decision-making abilities in Slovak conditions. Feed requirements accounts for 40 % to 70 % of the cost of raising replacement heifers and is generally the greatest expense for milk production. There are several key decision-making levels related to calculating of income over feed cost (IOFC). In order to make this process user friendly, a web-based tool will calculate actual feed costs and amount of feeds per cow per day, daily income from one cow, concentrate feed used to produce 1 kg of milk, yearly IOFC, and allow the comparison. The sensitivity analysis will identify the uncoordinated one in terms of economic returns and key production impacts. The study's findings contribute to the understanding of animal production management routines and consequent economic impacts on dairy operation.

Keywords: *dairy, management, feed costs, IOFC, decision tool*

JEL Classification: *Q120*

Introduction

Optimal feeding strategies related to the unique herd specification represent the key role in efficient and profitable dairy operations. Important daily management agenda connected to profitability of dairy operation is feed ingredients and feed costs optimization. Feeding costs are generally the greatest expense for milk production in dairy farms. The most of the producers are typically focused on increasing total milk production, because this reflects in increased total milk incomes for farmer. With volatility in feed and milk markets, income over feed cost (IOFC) is a more advantageous measure of profit than simply feed cost per cow (Buza, 2014). According to Wolf (2010) the IOFC can include gross milk income and feed cost to better monitor profit. This approach to the farm profitability benchmarking simply quantifies the difference between the amount of income from marketed milk and feed costs, including both, home-raised and purchased feeds. As reported by (Bozic et al., 2012) the profit margin management can be done by monitoring IOFC. It can be also used as a feeding strategy evaluator, with the determination of economic impact on the farm profitability in the context of the current level of milk output sales. As stated by (Vibart et al., 2012) the IOFC can be used as a measure of feeding implementation level in dairy operations. The IOFC tool, as a benchmarking method, is not commonly used in Slovakia.

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In this paper we reflect on our experiences in developing and delivering management decision tool for dairy farmers in Slovak conditions. The effect of various ration composition and related costs was evaluated.

Data and Methods

The application EkonMOD milk, the decision support tool concept for dairy farm managements is used to evaluate the economic consequences of different on-farm feeding strategies. The selected module Yearly milk income over feed costs was developed to raise the awareness about feeding costs related to the milk production and it is used in this paper as a tool to evaluate specific economic and production parameters of a user specified dairy operation. EkonMOD milk is developed in SAP Business Objects Dashboards (version 4.1) and was developed by National agricultural and food centre in Nitra. The core of the application consists of a main Microsoft Excel input and output worksheet, containing basic algorithms and formulas for computing selected farm specific economic and performance outputs. The interactive dashboards are used to illustrate the impact dynamics of the changed variables and they represent the visual add-on to the Excel core application. The tool combines inputs and transforms then into information source - output for farmer by operative construction of economic a production model from individual farm data. Yearly milk income over feed costs will be calculated by EkonMOD milk using following herd specific input metrics: price per ton and daily amounts of all feed components used at the dairy farm, number of dairy cows, total daily milk production and milk price. The application will calculate actual feed costs (FC) and amount of feeds (AF) per cow per day, daily income from one cow (DI), concentrate feed (CF) used to produce 1 kg of milk, roughage costs (RC) per kg of milk produced, concentrate and additional feed costs (CAC) used per kg of milk produced, and allow the comparison between different feeding scenarios, by calculating yearly income over feed costs (IOFC). The yearly IOFC represents the difference between total milk revenues and feed costs during one year period (1).

$$\text{IOFC } (€) = \text{MP} \times \text{TMP} - \text{TFC} \qquad (1)$$

where:

MP is the average milk price

TMP is the total milk production (year)

TFC is feedstuff costs required to produce the amount of milk reflected in TMP

The feeding costs are not divided into home-raised and purchased in this model. The calculations give the overall view on the dairy farm, in terms of benchmarking the feed ration to the income per year. However, some producer may not be aware of what the costs of home-raised feed exactly are. In this case, the EkonMod milk tool web site offer the information about the latest developments in the market prices and other relevant updates for dairy farmers.

Results and Discussion

Feed costs are directly linked to the milk production. However, milk production focusing on output maximization in not necessarily linked to the profit of dairy operation. Another important issue is

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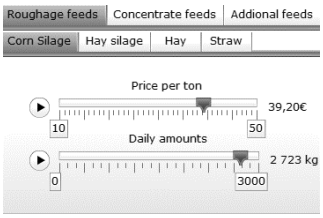
knowing the difference between the IOFC calculation on the cow and herd level. The individual cow milk-yield basis gives not the accurate view on the farm economics. The sick and non-lactating cows represent the hidden costs, which are typically excluded when computing IOFC per cow. However, these cows need to be fed and in addition to this, they do not generate any income from milk. Calculation IOFC on a herd level will ensure a broader perspective on the financial condition and productivity from given amount of feed inputs. The input section of the EkonMod milk tool can be seen in Figure 1. The user specifies the daily amounts of roughage feeds, concentrate feeds and additional feeds, respecting the relevant subcategories in the first scenario. The user-friendly format, developed during the consultancy with farmer improves the communication interface, and allows to incorporate any change by simple slides with bars for every input used.

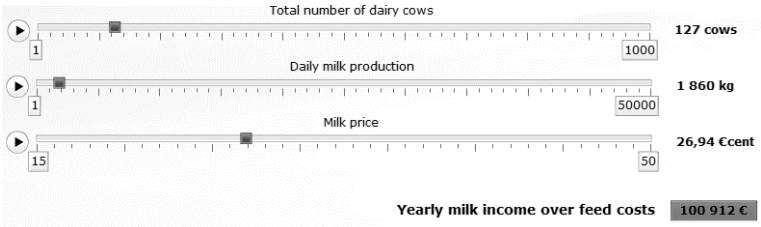
Figure 1: EkonMOD milk model calibration



Source: EkonMOD milk screenshot, section for inserting farm specific inputs

The first milk incomes scenario from 127 dairy cows reached 100 912 € in this model. The daily milk production amounted 1860 kg of milk, with the milk-yield 14.6 kg per cow. The price level for milk shipments was set to 26.94 € for 100 kg of milk. The share of feed costs on total incomes from milk totaled 45 %. The result of IOFC calculations from given inputs in first scenario can be seen in figure 2.

Figure 2: Results of the IOFC calculation (scenario 1)



Source: EkonMOD milk screenshot, section computed IOFC.

Note: Total number of dairy cows, daily milk production and milk price indicators are adjustable by the user

The system of illustrative dashboards of the EkonMod milk tool can be seen in figure 3. These dynamic indicator represent the information base for sensible decision-making of dairy operation feed management. The values in the dashboards reflect the inserted data form input section of the EkonMOD milk tool.

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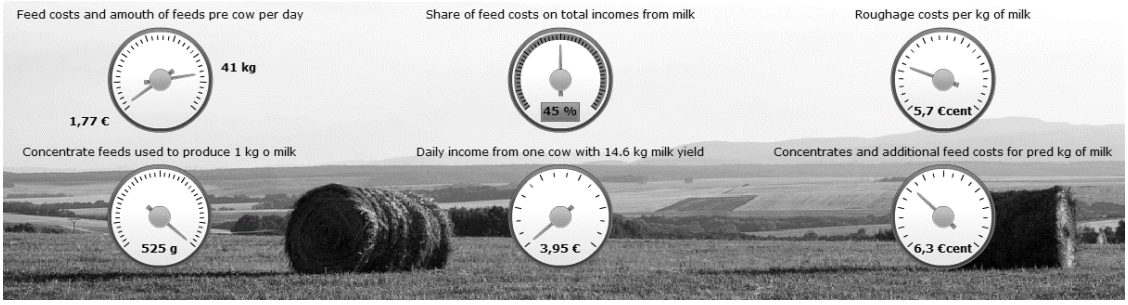
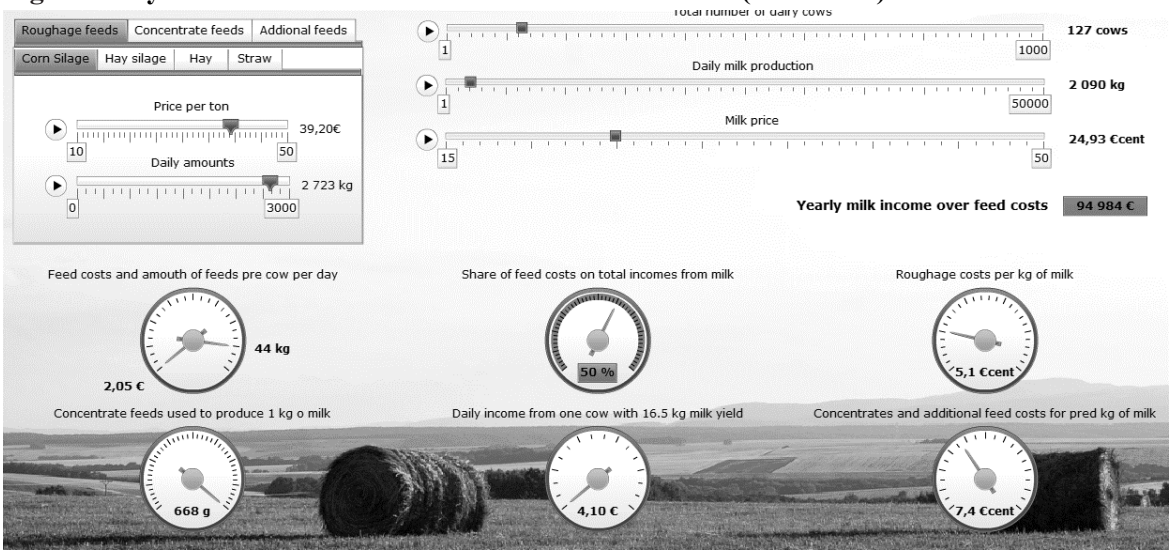
Figure 3: Dynamic dashboards of the EkonMOD milk tool (scenario 1)



Source: EkonMOD milk screenshot, section with dashboards containing computed results for farmer

Increased daily milk production (shipments +230 kg), increased feed costs and amount of feed per cow per day (+ 0.28 € and 4 kg), increased concentrate and additional feeds to produce 1 kg of milk (+ 1 €cent), decreased roughage cost per kg of milk produced (-0.6 €cent), increased daily milk income from one cow with 16.5 kg milk yield (0.15 €cent and 1.9 milk yield) and increased share of feed cost on total incomes from milk (+5 %) led to the overall decrease in yearly milk income over feed cost by 5928 € in scenario 2. The graphical interpretation of this alternative management approach to milk production can be seen in figure 4.

Figure 4: Dynamic dashboards of the EkonMOD milk tool (scenario 2)



Source: EkonMOD milk screenshot, section with dashboards containing computed results for farmer

Conclusion

The key factor when considering IOFC is to revise the calculation when unexpected changes in milk and feedstuffs prices occur, or new potential management decision has to be evaluated first. Another important characteristics of this approach is different pricing of inputs between dairy operations in comparisons. Despite this limitation, the IOFC tool is confirmed to be a viable source of information for dairy farm managers in combating the price volatility on the markets and could be vital in creating benchmarks against the goals of the farm itself. The EkonMOD milk tool does not link to fertility and health issues. However, the simulation of the effects of changed fertility and other issues could be implemented in the future work by using linear and dynamic programming, hierarchic Markov processes, Bayesian networks and influence diagrams. At the current state of development, the EkonMOD milk tool evaluates the risk associated with changes

in milk prices and ration costs, however, as the model simulates only a one year period, risk aspects related to the management throughout the years cannot be considered. The concept of communication with farmer is open to joint research team to bring relevant and diverse expertise into this decision support tool in Slovak conditions. These experiences are vital for future research and development activities in the field of dairy production in Slovakia.

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SESSION 13

Doctoral session

„Young science“

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Good practice examples of a small settlement

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Abstract
Any human intervention have some impact on the environment. The land development professionals try to realize interventions in their work, resulting in improvement in quality of life of local communities. The local problems often lead local responses that take into account the opinion of the members of the local community. The life of the settlements, the direction of the development of the local governments greatly influence their decisions often determine the situation of the town for years. Solving treatment of municipal and regional differences prominent role for local governments. Good practice, practical knowledge of resource management of local governments can be decisive. In my study I will present Csikvánd Village as an example of local initiatives and implemented improvements that will result in the settlement of regional level can be considered.
The basic aim of the research was to show them the local development of tools, practices, which can be successful in the settlements.

Keywords: *development, government, local development, sustainability*

JEL Classification: *O18, P25, R51*

1. Introduction

One of the defining issues of regional and rural development include improving the ability of municipalities to retain the population, the quality of life better. „The national land development practice, mostly outside heavily relying on resources development came to the fore. Today proved that the existing problems is often not possible to find a lasting and sustainable solution to clean using external resources. The decision on the external economic, informational resources occurs outside the regional community, so they can not always be realistically assessed and taken into account the interests of the local community and the local community commitment to targets may undermine decisions made outside their area. Therefore, in some areas, settlements external resources based on a quick recovery is often followed by equally rapid decline. In addition, these external resources often do not come from a disadvantaged geographical, economic and social situation in the regions, because that is where the reception conditions of the working capital (established infrastructure, skilled labor etc) are not met. The external resources so alone do not offer solutions to prevent marginalization of these regions." (Czene – Ricz, 2010)

The key players in local communities, local authorities, which play a decisive role in both the external and the mobilization of internal resources. A significant number of municipalities implemented projects to successful self-government applications due. However, the area allocated to the external source does not mean they are long-term sustainable development. That is why we are becoming an increasingly important factor in the internal (local) resources during development. In an optimal return on internal resources and would be the transformation of new resources in a sustainable way / it would create added value in the area, or even outgrow this particular area unit. (Czene - Ricz, 2010 from Áldorfai-Czabadai, 2014).

„The new regional policy to the forefront of areas, regions endowments were potentials are for development as an endogenous resources are available, and be activated in appropriate conditions.” (Káposzta, 2001).” The priority is gained of the factors in determining exploration, acquisition or development of that area is a "stand-alone" economic and social development, development, supply items as a starting contribution.” (Ritter - Nagy – Tóth, 2013) These factors, internal resources relate to social activity in the region, local economy, infrastructure, environmental conditions can arise and the opportunities offered by the outer material and spiritual wealth of capacity to absorb. (Goda- Káposzta- Péli L. 2013a; Goda-Tóth, 2013b) The "success factor" of course not in itself contribute to the development of an area of six socio-economic and environmental resources in the region of all. (Káposzta- Kis- Goda, 2013) It will be available through optimum utilization of regional resources, improvement of quality of life and living conditions. The regional sustainability, such as local economic development regional autonomy amplifier, information, energy, money, goods and raw materials flow of intra longer the region to encourage the idea apparently is in contrast to regional development to another, often mentioned European ambition, competitiveness of the regions by strengthening. However, the contradiction is only apparent. The regional competitiveness, properly interpreted, because it means that you will find every region has its own unique competitive factors. The internal resources roots, (partially or completely) autonomous local economies are organized in this key role you can get, it can be an important factor in competitiveness. (Czene – Ricz, 2010 from Áldorfai-Czabadai, 2014)

The central level to support the local social action also appeared in the last decade. Thus, the United States was established in 2009 in order to seek the citizens and the civil society in solving social problems in new ways in addition to encouraging the President at the institution of „White House the „Office of Social Innovation and Civic Participation”. Was launched in 2014 after the adopted in 2011 "Social Business Initiatives” (EC 2011) The European Union is one of social innovation policies Horizon2020 the program for the research and innovation process for embedding „Social Innovation Europe Initiative‖ (Reeder et al 2012 from G. Fekete 2015).

„Good practice in local economic development requires tailored approaches to local conditions. According to our experience of the principles listed below are particularly useful:

- **a holistic approach** that addresses the social, environmental and economic problems as well;
- **the right** strategy built by all relevant partners and based on a shared vision;
- **a series of initiatives -** short-, medium- and long-term - to catalyze partnerships and build stakeholder confidence;
- **local leaders** who radiate commitment and credibility to be able to unite the stakeholders;
- **the management capacity to develop and practice teams** is essential for the implementation of programs;
- **the LED strategy should feel ownership of the local government,** and should demonstrate strong political will to achieve;
- **the government's political, financial and technical support** from other levels of added value to the efforts.
- **integrated approach** to LED measurement and evaluation.” (Meise et al., 2003 from Áldorfai-Topa, 2015)

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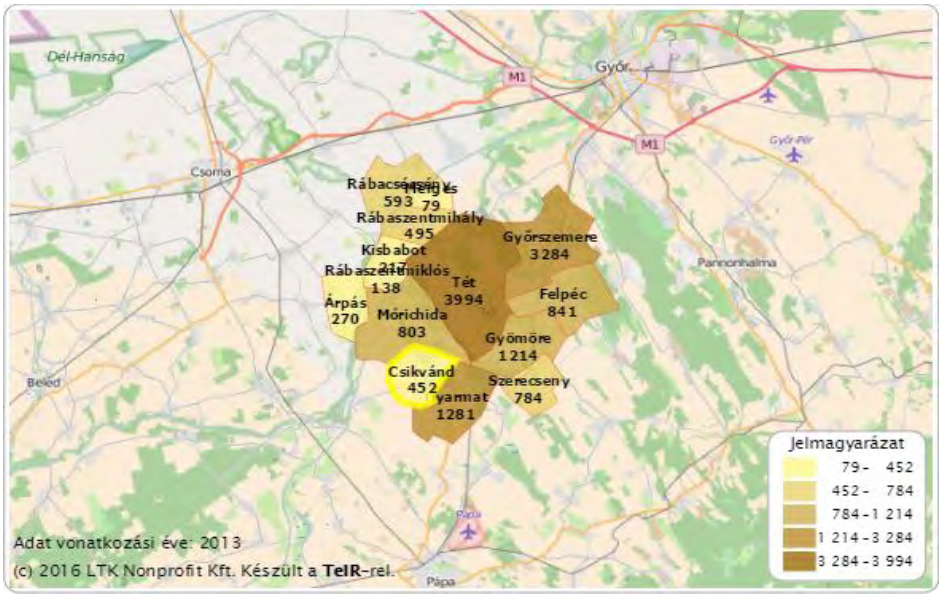
„A successful private companies, and public and private sector productive cooperation create wealth for local communities. Private enterprises at the same time business-friendly environment is necessary, which helps the economy thrive. The essential role of the government is that creating the right environment for business success and prosperity. Local economic development - by its nature - the business sector, the community and the local authorities Cooperation Fund." (Swinburn et al., 2004). „Local economic development activities carried out by anyone, but a decisive role in initiating and organizing parties. In Hungary, for example we find that this non-governmental organizations, private individuals, local governments, a company or other institution, organization. Abroad frequent local economic development agencies set up to organize the local economy." (Czene-Ricz, 2010).

This study attempts to present the impacts of development projects implemented by the Municipality of Csikvánd through the analysis of socio-economic indicators.

Csikvánd settlement (Figure 1) is located in Győr-Moson-Sopron county, and under the jurisdiction of 1 January 1992. Nearest big city Gyor (32 km), which was newly created colonial access road through the 83 No. main road can be achieved. The nearby towns of Tét (7 km) and Pápa (20 km). There is no railway line in Győr-Pápa and direction of the vehicle buses. The majority of residents working in Győr, and learn from, some of Papa and the surrounding businesses (Csikvánd Village Website).

Figure 1 Csikvánd location within the district Téti



Source: TEIR, 2016

2. Data and methods

Testing took place in the life of the town government intervention was required results and to assess the current situation of previous state settlement on the basis of diverse criteria, during which we tried on complexity. Both primary and secondary research used in the situation analysis. The mayor of the town by interviewing experts Poll conducted. In addition to fixing the issues important development data they were directed to the general public what the prospects may represent the realized investments and measures.

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The secondary research was made on the basis of statements from the settlement can be found, public data. The sources of information were mainly online statistical data collection and service agencies Web pages, such as the Central Statistical Office (KSH) website, the fundamental social, economic and infrastructure situation in the TEIR settlements interactive maps, application diagrams showing Situation-Background-image was. Mayor in the first year of the currently reigning / position to choose the base year (2006) is considered. Regional level of the test period, the sub-regional level, as established by the institution through the multi-purpose associations of municipalities is collaboration and joint service provision are currently each other.

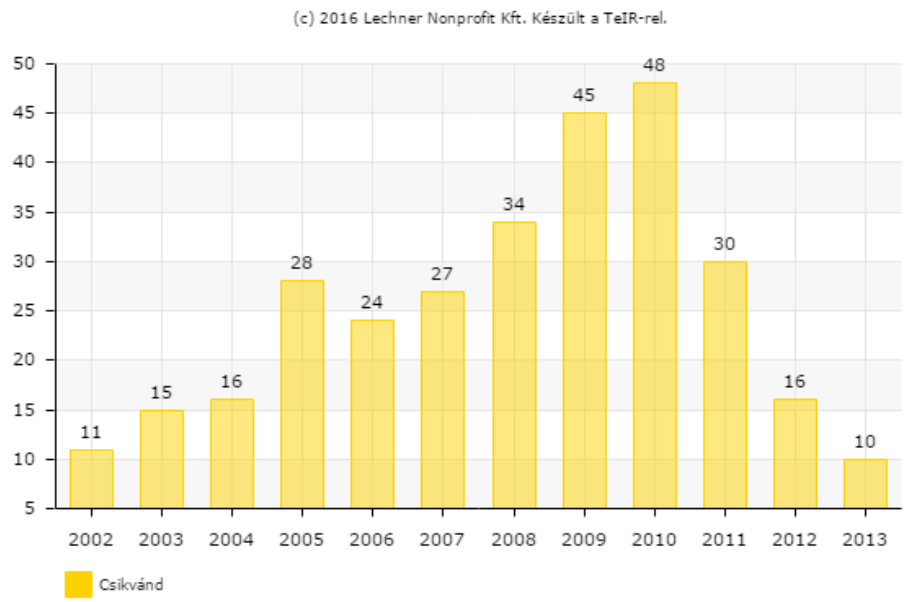
3. Results and Discussion

Wider aspect we tried to examine the available data and local characteristics during the test. The examined indicators of the local society, the economy, infrastructure, the environment and the tourism situation in organized groups. A brief summary of the results includes the following topics lap description.

Local social, employment

Looking at the residential population data it can be said that the settlement population of the period under review (2006-2014) is below the regional average. The number of village population is steadily decreasing since 1960. The village migration balance of the economic crisis shows a positive shift above the regional average, after the crisis, however, observed a sharp negative movement. Presumably, the crisis caused by the economic environment caused employment and quality of life deterioration of the settlement, which facilitated the settlement of migration. The settlement aging index also seen a dramatic increase in the rate is well above the regional and county averages. From the constant and massive population decline of 18 to 59 year olds can cause deterioration of the value of the index. A dramatic increase in the number of registered unemployed is also associated with the crisis in a country-wide trend. Similar trends can be observed in the evolution of the unemployment rate. A gradual reduction in headcount is likely to involve their public employment due.

Figur 2 Number of registered unemployed (head)



Source: TEIR, 2016

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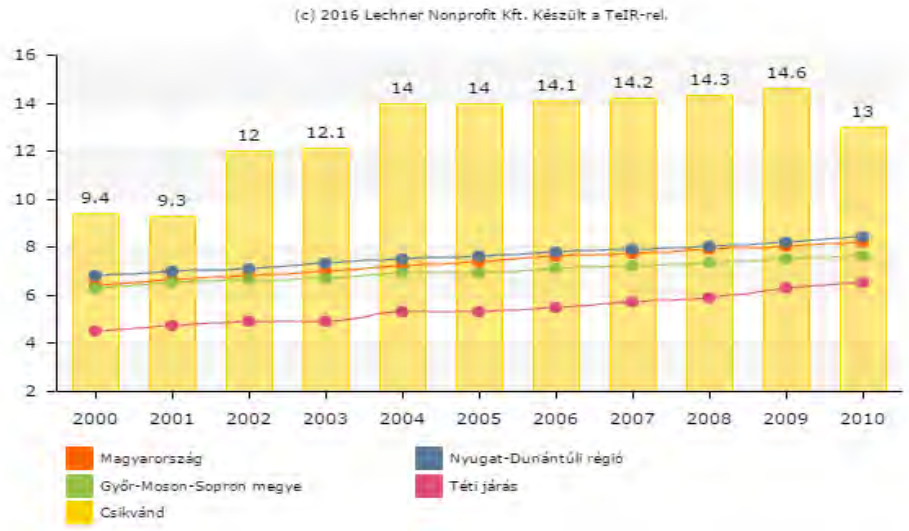
The social activity and engagement is perhaps best represented by the number and activity of non-profit organizations. As shown in relation to the settlement it can be said to be extremely high social activity, since the number of non-profit you get significantly higher than the county and national averages, although they follow the trends. The number is more than double the regional average.

Figur 3 Number per thousand inhabitants registered non-profit organizations 2010



Source: TERI, 2016

Local economy

The amount of the per capita net income has grown consistently though, but well below both the regional and the provincial and national average, which may be related to the low educational level of the workforce. Csikvándon per thousand inhabitants, the number of registered business enterprises in 2010 was 135, which represents a 128% increase compared to the 2006 benchmark year. This value is slightly above the regional trend, but rather below the county and national values. Nearly one-third of businesses linked to agriculture and forestry, which is appropriate and adapted to natural conditions in the village. During my primary research respondents Tibor Kozma (2014, 2015) mayor's view, part of the Public Works using revitalized agricultural production remains an example to be followed in the settlement. Thus, the low-skilled can engage in production activities, which may be the result of the periodic agricultural products sold in local markets nearby residents. It is, however self-serving interests and backyard farming, horticulture start, costs required to maintain, which may have been too burdensome together among the poorer families in the surrounding communities. I think the authorities can help you get started, which has already seen examples of our environment. One would be required to build sustainable micro-management system after the initial steps that owns land or animals kept in long-term income and livelihood can provide to farmers. The inward turning of small villages can not be possible, in close cooperation with the environment not only by the one-way employment insurance for the future to happen. (Kőnig, 2014)

Tourist situation

In the period under review examining the statistical data available for 2013 were not registered commercial accommodation in the locality, which is also spent by the number of overnight stays of foreign guests and guest nights categories also shows the proportion of zero. Operated by the number of self-catering units in the period under review ranged between one and four,

the last two years the time to come up with the numbers decreased. The number of retail stores operated by self-employed person can be said to be stable in the period under review.

Infrastructure

The settlement did not find a kindergarten, primary school, these services in the neighboring village colonial is only granted because the government will ensure that the basic framework of institutional care for people living in the locality association. The built drinking water, wastewater network deployment will take place in the near future. he quality of public spaces and public perception of safety is average. In recent years, numerous investment, development realized in international and domestic tender sources. Received funding from the township several associations, local can now traditional festival, has been renovated under the protection of several local cellars, the amount of aid was the order of close to thirty million. It is also close to what amount of aid designed Integrated Community Service Area. The church received a new look, a sports locker room, municipal building in the center of the town and its surroundings, a disused shop in the village museum can function.

4. Conclusion

Success does not mean the same thing to everyone. The results will depend on the success that we know whether under their own abilities / opportunities and specific environmental conditions and the moment these opportunities if we can seize. (Molnár, 2012). Primary and secondary studies were analyzed using the selected villages, from the point of view compared to the municipalities in the region is how indicators. Examine the environment, the existing human resources for the approach that the micro- and macro-economic medium, how can the resources devoted to their own situation / empowering.

We have seen that the country and even Europe is characterized by trends have appeared in the elderly living in settlements or in terms of the number of young people. However, significant differences were observed regarding the social activity. t is likely that this town is a living resource that bridges the gaps of such a nature as kindergartens, schools and the existence of consent to the settlement does not characterize the radical population decline. The local economy of the natural environment was possible to adapt the characteristics, which basically means agriculture. A significant number of local businesses in this area are represented. As a new element appeared in the local government entity, which thereby becomes the employer of a part of town living. The current management of land and quantity suitable for local needs, but the grown and produced products on the market is not the only player in a competitive position. The system is required to maintain and to operate in a similar position in cooperation with. The study of tourism indicators, if we assume that a settlement is said to be successful in this field, if you have a service-related infrastructure, you Csikvánd in this area failed. However, if we look at is whether at all a tourist destination, which lay the foundation for a multi-day settlements stay, well, in this case, the settlement a success, as recognized by the fact that no such of attractions and did not constitute sham investment. Investments related to the existing infrastructure were justified so far as determinants of the quality status of the natural and built environment in an appropriate quality of life category.

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Applied pro-social behaviour of companies – social marketing

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Abstract
Company, its brand, product or service gets to the customer´s awareness by realization of various social campaigns. By the right choice of target market during realization of activities in area of social marketing, company can not only increase its incomes, but also strengthen its market position and its relationships with internal and external stakeholders. Pro-social behaviour is linked to compliance with social norms, which prescribe behaviour expected by a society. Complicity of companies on various socially oriented projects is required from them directly by consumers. But the question is, whether it is possible to look at social marketing as an applied pro-social behaviour of companies – while marketing activities are planned, carried out with certain goals and objectives and with purpose to reach profit, pro-social behaviour does not result from obligation and does not expect anything in return.

Keywords: *personality, company, pro-social behaviour, social marketing, corporate social responsibility*

JEL Classification: *M14, M31, M37, M51*

1. Introduction

Changes in the value system of individuals in the society result in orientation of consumers and other company stakeholders on non-material values such as abidance of human rights, protection of environment, fight against corruption, sustainability, etc. Enterprises and organizations are aware of the fact that nowadays the orientation on quality of products and services is not enough and that it is necessary to care about the impact of their activities not only in local, but also in global scale. Development in the field of marketing activities has gradually shown that economic interests do not have to be contrary to social interests, but they exist parallel next to each other (Čarnogurský & Choma, 2013, p. 104). It is therefore on the consideration of enterprises and organizations whether this concept of corporate social responsibility becomes part of their corporate philosophy and enables them to approach their customers.

Social marketing in specialized literature is explained as a form of corporate social responsibility. Although the social marketing is based on commercial marketing there are significant differences between them which are analysed by the authors Kotler and Lee (2008, In: Čihovská & Kováčová, 2011, p. 5), according to who one of the main differences between commercial and social marketing is in the ***type of product*** they offer. Whilst the commercial marketing is oriented on the sale of products and services – resulting in financial profit of the enterprise or organization, in case of social marketing we can speak about the "sale" of ideas, attitudes and behaviour – resulting in the benefit of the whole society. This way enterprises show not only their interest in consumer, but also in the society itself and in solving various social problems.

Within the pro-social behaviour we speak about empathizing with others, about understanding the respective situation and about subsequent provision of help which can have various forms, from emotional support to material help. It is however questionable whether *"there is such*

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pro-social behaviour of individuals or groups which does not count with any profit and brings only genuine inner satisfaction" (Čarnogurský & Choma, 2013, p. 101). When we are talking about social marketing this question is appropriate. Are the activities performed by enterprises and organizations within social marketing really unselfish? And if they are not, can we say that the enterprises and organizations perform them with the real interest in problems which they help to solve by these activities?

The present study presents a plan of research within which we will analyse the communication of socially responsible activities of a selected group of enterprises in Slovakia within the social marketing. We will focus on the fact whether the enterprises and organizations, which are members of informal associations declaring corporate social responsibility, engage in activities performed within social marketing and whether these enterprises present their activities via media (e.g. television, newspapers, magazines, Internet, etc.).

1.1 Basic aspects of pro-social behaviour

Pro-social behaviour encompasses a wide category of activities which are peculiar for the selected segment in the society and are perceived by the social group of individual as beneficial for the others (Penner, 2005, In: Giles, 2012, p. 49). This term covers wide spectrum of expressions which have in common mainly the intention of helping the others - Helus (2011, p. 245) speaks about the capability of making them happy, protect them against danger, etc. This implies that it covers the relations of reciprocal help and support. However, pro-social activities within the society can also be done by e.g. murderers or thieves, not only altruistic individuals (Gentile, 2009, In: Giles, 2012, p. 49). And thus in case of corporate environment a situation can emerge that enterprises which outwardly behave pro-socially and support socially beneficial activities can in fact damage the environment by their production activity, discriminate their employees, etc.

Our behaviour has its reasons, it is a reaction to some impulse from our environment. According to Helus (2011, p. 245-246) it is possible to distinguish three main sources of pro-social behaviour:

1. ***egoistic*** – I am helping someone else, but I am in the fore, I ponder what does it bring me – I will gain respect and admiration of others for my exemplary behaviour;
2. ***pressure of social standards*** – I respect and follow social standards – I am therefore obliged to help others in need;
3. ***empathy*** – I suffer with others, I identify myself with the misery of others and this forces me to act towards the others in such a manner as I would act in case of my personal need.

It is however questionable which of these three causes leads enterprises and organizations to the concept of social marketing and activities related to it.

Authors connect this type of behaviour with terms as attitudes, empathy, morality, conscience and the like. As an example we can state the mutual relation between morality and conscience which can be considered as complementary since the conscience *"is created in the process of interiorisation of general moral principles which become an integral part of mature personality and determine its pro-social being"* (Cakirpaloglu, 2012, p. 94-95). While ***morality*** represents the system of social and cultural standards, orders and prohibitions which initiate and regulate pro-social behaviour of individual, ***conscience*** initiates and regulates pro-social feeling, thinking and behaviour of individual via remorse and feeling of guilt (Cakirpaloglu, 2012, p. 94, p. 120). Thus, in case of conscience we can talk about some kind of "inner voice" which tells us what is right and what is wrong.

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1.1.1 Pro-social behaviour versus altruism

Confusing of the term altruism with the pro-social behaviour occurs more often. It is possible to talk about certain terminological disunity which is accompanied by certain differences in meaning – some authors use the given terminology as synonymous, others strictly differentiate between the meanings of these terms; the definitions of these differences also vary (Výrost & Slaměník, 2008, p. 285). However, these are two different terms within two significant theoretical concepts, i.e. ***evolutionary*** (i.e. altruism, position of biological evolution – genes) and ***sociological*** (i.e. pro-social behaviour, position of cultural evolution – imitation) (Baštecká et al., 2013, p. 66). Barrettová, Dunbar and Lycett (2007, In: Baštecká et al., 2013) define altruism as a certain *"act which brings benefit to its recipient and causes certain costs to the donor"*. Helus (2011, p. 245) defines the term altruism as specified pro-social behaviour which is characterised by unselfishness or acting for the sake of others even at the expense of oneself. Kučera (2013, p. 121) defines pro-social behaviour as attitudes and behaviour leading to the benefit of others without expecting any kind of reciprocal service or reward. On the other hand, Hubinková (2008, p. 168) defines altruism as pro-social behaviour which is performed for the benefit of others without the expectation of any reward. It is therefore not clear from the stated statements when we can talk about altruistic and when about pro-social behaviour, since both terms inosculate in many features. Nevertheless, it is possible to state that altruistic behaviour is based on self-sacrifice for the benefit of others, while in case of pro-social behaviour we talk about "doing good" which is demanded by the society and which respects social standards.

1.1.2 Personality and pro-social behaviour

Personality represents *"individualised system of psychological processes, states and qualities which result from socialization, transformation of innate inner conditions of human existence and which determine and manage subject activities of individual, his social contacts and spiritual relations"* (Smékal, 2004, In: Říčan, 2010, p. 14). Lenz (2000, In: Kosová et al., 2014, p. 121) states that ***pro-social personality*** is the creator of culture, human rights and social values and it is characteristic for it to remain optimistic, supporting institutions, able to offer help, empathic, able to become impersonalised and gain followers despite the complexity of problems to be resolved. Based on this characteristic of pro-social personality we can state that pro-social behaviour demands the ability to lead people towards changes and react to possible problems which can result from these changes. As we have stated at the beginning of the chapter, pro-social behaviour is a behaviour which is aimed at the benefit of others, such as donation, help or service. However, this behaviour indirectly brings also self satisfaction and growth and strengthening of the character (Nováková, 2014, In: Kosová et al., 2014, p. 121) which the individual is often aware of and therefore he repeats his behaviour.

Should we apply pro-social behaviour in marketing environment which is formed by enterprises and organizations and individual personalities working in them, we can state that it would become one of strong marketing tools of many enterprises or organisations. On one hand, it would contribute to strengthening of relation with key stakeholders; on the other hand, even the enterprise would profit from this behaviour, for it would strengthen its position on the market and earn a good reputation among consumers. It is however questionable whether this behaviour can be considered as solely pro-social in this case, since the doer of this behaviour realises that he can profit from it. And thus, can we really talk about unselfish help from the side of the enterprise or organisation?

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1.1.3 Basic theories explaining pro-social behaviour

To help us better understand the basis of pro-social behaviour in literature we can find theories which explain why we behave pro-socially, what makes us do that and, on the contrary, why we behave antisocially in certain situations. Kučera (2013, p. 121-122) specifies four basic theories defining pro-social behaviour. First of them is the ***social exchange theory***, according to which pro-social behaviour brings a reward in the form of self-satisfaction. This concept is followed by the ***cost benefit theory*** which is based on pondering upon provision of help on the basis of four main criteria, namely the costs connected to the help (e.g. energy, time), costs of non-provision of help (e.g. social criticism, self-reproach), reward connected to help (e.g. appreciation by the society) and a reward of non-provision of help (e.g. benefit from own activities which do not relate to helping). The second theory is the ***empathy-altruism hypothesis*** based on which the principal motives of helping are egoistic, altruistic, collective or principled. The last two theories – ***kin selection theory*** and ***reciprocal altruism theory*** – are mainly connected to the evolutionary explanation of altruistic behaviour. However, their detailed theoretical definition within the matter of pro-social behaviour application into the field of social marketing is not crucial for us. Within the research we will deal with the first two theories in detail and look for the answer to the question what leads the enterprises and organisations to act pro-socially, or if it is possible to regard social marketing as unselfish from the side of enterprises or organisations, or it is only a strategy for creation of positive PR.

2. Data and methodology

By study of available literature and specialised studies, as well as research activities carried out in the past dealing with the analysed issues, it is possible to formulate the research problem, work hypotheses, as well as primary aim and partial aims. Primary aim is to find out whether the enterprises which are members of informal associations declaring corporate social responsibility carry out activities performed within social marketing by which they declare the principles of pro-social behaviour. Based on the content analysis of marketing communication and social marketing activities of the selected group of enterprises we would like to point out the growing involvement of enterprises in the field of corporate social responsibility and social marketing activities. Partial aims are to discover whether:

- the enterprises which declare principles of corporate social responsibility focus on social marketing;
- the enterprises which direct their attention to social marketing publicize their activities in media;
- the enterprises which present themselves as socially responsible are perceived by consumers rather positively or negatively.

Based on the partial aims we can formulate hypotheses by testing of which it is possible to clarify certain significant relations between the concept of social responsibility and social marketing activities which can be regarded as a form of pro-social behaviour.

1. ***Hypothesis:*** Enterprises which have corporate social responsibility incorporated in their business philosophy, engage in social marketing.
   Justification: The concept of corporate social responsibility currently brings new perspective of the social role of enterprises and organisations which should perform their business activities in line with the economic, social and environmental level of CSR concept. Social marketing together with corporate philanthropy, corporate sponsorship and donorship, corporate foundations, matching funds, social investments and the like, create unified concept of CSR (corporate social responsibility) (Pavlík,

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Bělčík et al., 2010, p. 45-48; Svoboda, 2009, p. 67; Kotler & Lee, 2004, In: Kotler & Keller, 2007, p. 60; Šmajs, Binka, & Rolný, 2012, p. 162-164). And thus marketing workers should take into consideration social, ethical and responsible aspects of business in carrying out marketing activities.

2. ***Hypothesis:*** Enterprises which engage in social marketing present their activities via media.
   Justification: Enterprises and organisations should provide more information about their socially responsible activities via CSR reports, as well as by making the information about specific performed activities available to public (Jurová, 2011, p. 99). The information should be easy to understand, true and provide information about activities, strategies and procedures applied within socially responsible activities of the enterprise and organisation.
3. ***Hypothesis:*** Enterprises which present themselves as socially responsible are positively perceived by consumers.
   Justification: Enterprises and organisations influence stakeholders by their activities with the aim to create and maintain positive relations with them and to achieve mutual trust between both parties (Svoboda, 2009, p. 17). Establishing positive relations subsequently helps the enterprises and organisations to strengthen positive attitude of end consumers towards the company, brand and its production, and thus to contribute to achieve company targets such as improvement of reputation and overall image of the company in the eyes of public (Srpová & Řehoř, 2010), which, besides the product offer, expects the company to behave socially responsible.

As a sample for our research we selected enterprises working in Slovakia which have the principles of corporate social responsibility incorporated in their business philosophy and are members of an informal association of enterprises, by which they commit themselves to become leaders in promotion of responsible business principles, and they focus on social marketing - namely they are the enterprises associated under the name ***Business Leaders Forum (BLF).***

Picture 1: Members of the Business Leaders Forum association

Source: Business Leaders Forum, 2015

BLF is a member of European platform CSR Europe and its role is to cultivate the society by creating and introducing standards of responsible business mainly by voluntary integration of principles taking into account social, ethical and environmental aspects of business. At present, the association has 34 members (Picture 1) working in various business spheres.

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For the analysis of social marketing communication of enterprises and as a main research method we will use the content analysis with the use of which we can observe the representation of individual selected categories within social marketing campaigns, which cover principles of social marketing as a set of activities of pro-social form of behaviour. We chose the method of content analysis due to work with social facts since there is conversion of qualitative data to quantitative data (Nový & Surynek et al., 2006, p. 273), which subsequently enables us to test hypotheses and compare gained results (Jandourek, 2008, p. 47). This way we will be able to evaluate suitability of performance of individual marketing activities from the view of enterprises and organisations and point out the suitability, or inadequacy of performance of analysed activities in consideration of the business sphere in which these enterprises and organisations work. To process data gained by content analysis we will use adequate statistical methods, namely non-parametric statistical methods which work with quantities (e.g. Chi-Square Test of Independence) or with serial numbers which are assigned to original data (e.g. Kruskal-Wallis test) (Rimarčík, 2007). Disadvantage of non-parametric statistical methods in comparison to parametric methods is their lower sensitivity and relative inaccuracy (Markechová, Stehlíková, & Tirpáková, 2011, p. 293). In statistical evaluation it is therefore better to prefer parametric statistical methods. However, these are not suitable for the analysis of our selected research set, since this research set is small and we have experience with non-parametric statistical methods from research activities carried out in the past (Kubaľáková, 2014). Based on ascertained data we will be able to determine relations between individual variables which subsequently enables us to verify or disprove formulated hypotheses.

3. Results and discussion

Results gained by content analysis of marketing communication of enterprises will determine the level of involvement of enterprises which claim corporate social responsibility concept, specifically in gaining resources for philanthropic purposes (e.g. financing of humanitarian projects, support of socially disadvantaged and the like) with the aim to support social programs. It is possible to state, that social marketing contains a set of methods and means which enable targeted effect on certain target groups of inhabitants - primarily on society as a whole, not only on individuals (Ambrózaiová, 2007, p. 18) – with the aim to promote, influence and change attitudes of target audience towards the social values (Čeledová & Čevela, 2010, p. 11) the creation of which is at present one of the key aims of enterprises and organisations (Džupina, 2013, p. 12). According to Lomnický (2012, p. 455) *"the pro-social dimension of communication deepens values of profound human respect, mutual respect, tolerance, understanding, politeness, courtesy and tactfulness"*. However, can we talk about these values even within business strategies of enterprises and organisations in connection to social marketing activities?

4. Conclusion

Nowadays, consumers are not willing to tolerate unethical behaviour of business entities and prefer products and services of those enterprises and organisations which are known for their socially responsible approach towards business in which they endeavour not only profit maximisation, but take into consideration interests of the whole society, for example by engaging in socially beneficial activities, putting stress on environment protection, business ethics, sustainable development and the like. Social marketing can be used to gain competitive advantage of enterprises and organisations, it helps to build good reputation of the enterprise and brand awareness, and last but not least, it increases interest of consumers in offered products and services (Chattananon et al., 2007, p. 231), since nowadays it is attractive and

demanded by consumers. Social marketing activities can distinguish enterprises and organisations from competition mainly by its emotional connection with customers. Experimental research activities point out that the level of business effort in the field of social marketing can in reality significantly influence consumers´ perception of enterprises and organisations and their socially oriented initiatives (Ellen et al., 2000 & Reed et al., 2007, In: Inoue & Kent, 2014, p. 626). And this is one of the reasons why social psychologists and researchers show increased interest in social marketing, namely in the fact when and why people behave pro-socially (Penner et al., 2005, In: O'Cass & Griffin, 2015, p. 827) and why should consumers subsequently favourably reacts to social marketing campaigns.

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Research of the impact of agricultural policies on the efficiency of farms

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Abstract
Common Agricultural Policy is one of the oldest as well as one of the most expensive policies of the European Union. Common Agricultural Policy accounted for circa 40 % of the European Union's budget. The aim of the presented paper is the analysis of agricultural policy impact on the agrarian subjects in Slovakia in the period 2007 – 2013. The source of the data is Information Sheets of the Ministry of Agriculture of the Slovak Republic. There is no significant technical inefficiency present when the production function model is applied with the subsidies as the part of the revenues. The subsidies might be considered as the input to motivate subjects and to increase the amount of the sales' revenues. However, production function model shows negative effect of the subsidies on the sales' revenues.

Keywords: *agriculture, Common Agricultural Policy, efficiency, Slovakia*

JEL klasifikácia: *C51, O13, Q18*

1. Introduction

The expansion of the European Union's (EU) economic and geographical size has led its budget to a steady increase characterized by phases of both reduction and accelerated growth, mainly due to the implementation of new policy actions.

The Common Agricultural Policy (CAP) is one of the oldest policies of the EU. Due to the CAP's long history, it is also a policy that has been reformed on many occasions, in particular during the past decade and a half. The CAP reforms reflect changes in the pursued goals of the CAP. The goals have evolved from food security in the beginning through competitiveness, sustainability and cohesion to policy efficiency with the CAP REFORM 2003. The CAP reforms together with growth of other EU policies have impact on the resources available to implementation of the CAP. The share of CAP expenditure on the EU budget has decreased very sharply over the past 25 years, from 73% in 1985 to 39% in 2013. This decrease has taken place despite the EU enlargements.

Expansion of the EU changed the situation in the CAP and created differences in the CAP subsidies. However, the European Commission acknowledged that the differences in support levels cannot be justified on a long term. On the other hand, a flat rate of direct payments is not a feasible solution in the environment consisting of states with different wage levels and input costs (Kosior, 2014).

The payments from the EU should have been leveled after 10 year period of the so called phasing-in. Therefore, today the question may be raised whether the phasing-in worked and if the CAP subsidies contributed to improve the efficiency of the agricultural subjects in Slovakia.

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1.1 Empirical background

There are rich sources of empirical studies aimed at the efficiency of farms in connection to subsidies. Bielik and Hupková (2011) employed data envelopment analysis for the research of the efficiency for the years 1999-2007 and found decreasing trend in the overall efficiency. Same method, that is data envelopment analysis, was used by Kleinhanss, Murillo, San Juan and Sperlich (2005), who addressed the efficiency in connection to the CAP. Authors' research showed that direct payments tend to increase efficiency and that the less environmentally friendly and larger farms are more efficient. Sojková, Kropková and Kováč (2008) estimated efficiencies for Slovak farms using the SFA. Results for the years 2003-2005 did not prove any trend in efficiency. However, farms operating in the less favored areas had better efficiency results than farms from the production regions.

In general, payments decoupled from the production are assumed to be less market disturbing. Furthermore, such support ensures farmer's freedom in the output structure (Pokrivčák, & Ciaian, 2004). These facts should help improve efficiency of farms. However, subsidies can either improve efficiency if they provide incentive to innovation or decrease it if, as a certain income, reduce the motivation of farms. How much the subsidies affect the performance of producers is a question for empirical research (Zhu, Demeter, & Lansink, 2012)

The article is structured as follows. Section two discusses the concept used in this paper for the measurement of the efficiency, and used data. In section three there are results presented. Section four concludes.

2. Data and methodology

Research of this paper is aimed at the agricultural subjects of the Slovak Republic and the comparison of theirs efficiency in the years 2007 and 2013.

2.1 Data

Data on the farms is drawn from the Information Sheets of the Ministry of Agriculture and Rural Development of the Slovak Republic. Time comparability of the financial entries is secured by the price indices drawn from the EuroStat.

The main variables of our concern are total output, capital, labour, and subsidies of non-investment nature for the estimation of the production frontier model and the quantification of efficiency measures.

2.2 Methodology

Producers are efficient if they produce as much output as possible with the employed set of inputs and if the given output is produced at the minimum cost (Pesaran & Schmidt, 1997). The measure of efficiency can be decomposed into technical and allocative efficiencies (Coelli et. al, 2005). Technical efficiency is an ability of a decision making unit to produce maximum output with a given set of inputs. The decision making unit is allocatively efficient if it produces given output mix using cost-minimizing set of inputs (Farrell, 1957).

In general, there are two main approaches to efficiency measuring, namely data envelopment analysis (DEA) and stochastic frontier analysis (SFA). DEA is a non-parametric deterministic method, which allows for multiple input and output variables to be engaged in the model of the production frontier. However, any deviation from the frontier is assigned to inefficiency of the decision making unit. On the other hand, SFA is a parametric method which accounts for the random noise as the part of the deviation from the production frontier. When applying SFA the mathematical form of the production frontier has to known or assumed.

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In this paper the Cobb-Douglas production function is estimated using variables listed in the previous section (see 2.1)

2.2.1 Stochastic Frontier Analysis

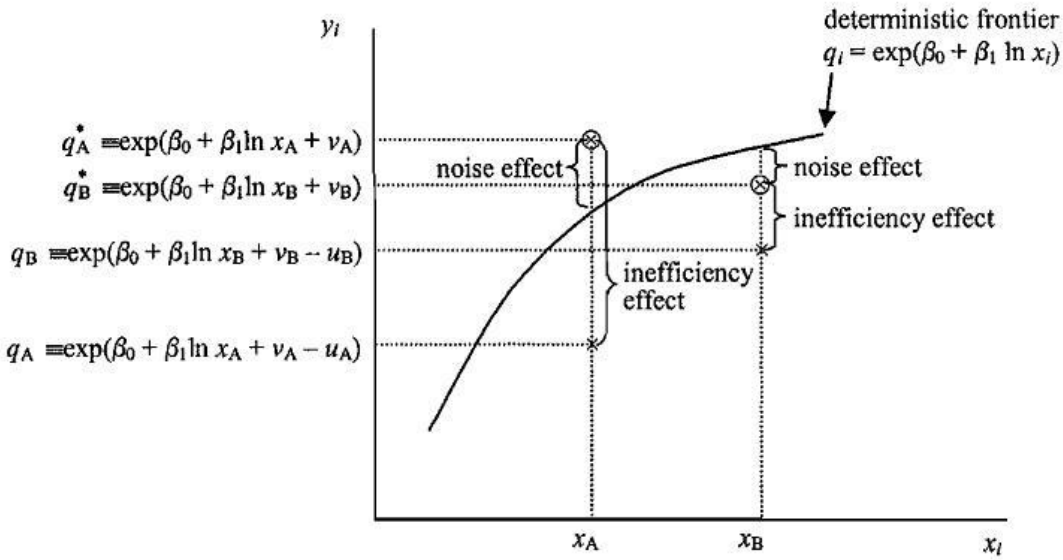
Statistical method applied in this paper for the estimation of efficiency measures is the SFA. Initially proposed by Aigner, Lovell and Schmidt (1977) and Meeusen and van den Broeck (1977) the SFA allows for the estimation of the production function model given by the Equation 1:

$$\ln(y) = \alpha + \beta * \ln(x_i) + v_i - u_i \qquad (1)$$

The SFA accounts for the fact that the quantity of *i*'s firm output is influenced not only by the efficiency of a subject but also by the noise effect (v_i). Deviation from the frontier is known as the compound error term, where the noise effect (v_i) represents impact of random external factors and can be positive or negative. (Greene, 2008)

Therefore, SFA model (Eq. 1) consists of three parts, namely deterministic frontier, noise effect and inefficiency (Fig. 1)

Figure 1: Three parts of the SFA



Source: Coelli, T. J., Rao, D. S. P., O'Donell, C. J., & Batesse G. E., 2005

Measure of *i*'s farm technical efficiency (TE) is computed as:

$$TE_i = \exp(-u_i) \qquad (2)$$

This measure (Eq. 2) takes values 0 - 1 and represents quantity of *i*'s farm output relative to the output achievable if the inputs had been used efficiently. The SFA assumptions are:

- v_i is symmetrically distributed,
- v_i and u_i are independent and identically distributed variables,
- v_i is distributed independently of u_i and both error terms are uncorrelated with the explanatory variables,
- v_i and u_i are homoskedastic. (Coelli et al., 2005)

When the SFA is applied, the presence of systematic inefficiency (u_i) is tested. In the case it is not present, the error term is symmetrical, u_i equals to zero and the error terms equals only to v_i. In cases where u_i is more than zero, compound error is asymmetrical, negatively skewed,

indicating inefficiency of studied subjects. Schmidt and Lin (1984), and Coelli (1995) proposed a test for the presence of systematic technical inefficiency (for details see Kubhakar & Lovell, 2000).

Estimation of stochastic frontier and inefficiency measures is based on the assumption of distribution of u_i. The most widely used distributions applied are half-normal, gamma, exponential, and truncated normal distribution. In practical application it has to be tested whether the deviations from the frontier could be assigned solely to the statistical noise (v_i) or if the inefficiency is present (u_i). The stochastic frontier is estimated by the maximization of the likelihood function (Coelli et al., 2005).

For the purpose of this paper the statistical software STATA 13 is used.

3. Results and discussion

Information Sheets of the Ministry of Agriculture and Rural Development of the Slovak Republic provide data for the complete list of the agricultural subjects. It is necessary to create a balanced panel of data for the purpose of comparison between years 2007 and 2013. The panel needs to be adjusted as not all of the farms existed during the whole period and therefore had to be removed from the database. Further adjustment included removal of subjects without received subsidies and removal of outliers. As a result the panel consisting of 768 farms is obtained. Using the price indices from the EuroStat the data is synchronized for the prices of the year 2014 allowing for the time comparison.

3.1 Impact of the non-investment subsidies on the technical efficiency

Estimation of the efficiency measures is based on the SFA with the exponential distribution of the u_i (see 2.2.1) in STATA 13. Production frontier is specified according to Cobb-Douglas function. Total revenues variable is used as the output, capital and labour as inputs. It has to be noted that the amount of non-investment subsidies is part of the total revenues. Based on the Information Sheets and accounting in Slovak Republic, non-investment subsidies are recorded as the part of the revenues. Efficiency measures are estimated for the year 2007 and 2013. Comparison of the results for these years should show if the farms are getting closer to the frontier and therefore becoming more efficient.

However, when the functional form from the previous paragraph is used, test for the presence of inefficiency shows that the deviations from the frontier should be attributed solely to the statistical noise. Therefore, no statistically significant inefficiency is identified. Former applies both to the year 2007 and 2013 (Tab. 1, M1 2007 & M1 2013).

Given that the studied subsidies are recorded as revenues in the books, second model is specified where only sales' revenues (difference of total revenues and non-investment subsidies) are used as the output variable. Input variables remain the same as in the first case. Applying such model gives results showing statistically significant inefficiency (Tab. 1, M2 2007 & M2 2013). This suggests that subsidies have positive impact on the performance of the farms. When the financial aid is not included in the model, agricultural subjects are technically inefficient contrary to the results of model incorporating subsidies (Tab. 1).

As mentioned earlier, non-investment subsidies are part of the revenues. However, this financial aid could be considered as the amount of funds that should be transformed into better performance and improved sales' revenues. For this purpose the third model is specified, both for the years 2007 and 2013 (Tab. 1, M3 2007 & M3 2013). The third model employs subsidies as the input variable, together with capital and labor. Sales' revenues are considered as the output variable. The third model once again shows statistically significant

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inefficiency. However, subsidies' variable is estimated to have negative coefficient. This suggests that the financial aid does not serve as the motivator corresponding to the higher sales' revenues (Tab. 1).

Table 1: Production frontier and efficiencies of farms in 2007 and 2013

	Const	Labor	Capit	Subsid	/lnsig2v	/lnsig2u	Ineff. Test	Average eff.	Eff. st. dev.
M1 2007	2.411 ***	0.251 ***	0.619 ***	-	-2.068 ***	-3.709 ***	0.075 *	0.865	0.052
M1 2013	1.537 ***	0.210 ***	0.700 ***	-	-1.763 ***	-10.456	1.000	0.996	0.000
M2 2007	1.672 ***	0.208 ***	0.705 ***	-	-2.015 ***	-1.545 ***	0.000 ***	0.684	0.176
M2 2013	0.208	0.188 ***	0.813 ***	-	-1.489 ***	-1.969 ***	0.000 ***	0.728	0.129
M3 2007	1.917 ***	0.229 ***	0.755 ***	-0.099 ***	-1.972 ***	-1.636 ***	0.000 ***	0.694	0.168
M3 2013	0.517	0.209 ***	0.855 ***	-0.095 ***	-1.451 ***	-2.087 ***	0.000 ***	0.739	0.120

Source: own work, STATA 13

To sum up the results, non-financial subsidies appear to have positive impact on the overall efficiency of agricultural subjects. Model which included subsidies as part of the revenues (Tab. 1, M1 20007 & M1 2013) tested negatively for the presence of the systematic inefficiency. On the other hand, subsidies, as the input to improve sales' revenue, are estimated to have small negative impact (compared to capital and labor coefficients). Therefore, non-investment financial support does not serve as the motivator for better performance (Tab. 1, M3 2007 & M3 2013). Considering the time development the average efficiency is estimated to be better in 2013, regardless of the model specification (Tab. 1; M1, M2, M3 2007 & 2013).

4. Conclusion

The CAP is still evolving political framework of the EU. The challenge for the CAP was flattening of the financial support among the countries. Tool for such flattening was 10 year period of phasing-in. However, subsidies in central and eastern European countries are not the same as in the old member states of the EU. Differences among countries together with the amount of the finances for the CAP create pressure for the effective allocation of the sources that does not distort the market and supports improvement of the farms' efficiency and competitiveness.

The aim of this paper is to assess the impact of the non-investment subsidies on the efficiency of agricultural subjects with the focus on the years 2007 and 2013.

Employing the SFA, the Cobb-Douglas production function is estimated for the years 2007 and 2013. When modelling the output including subsidies (that means as they are kept in books) there is no statistically significant inefficiency present. On the other hand, frontier for the sales' revenues shows significant inefficiency. Therefore, non-investment financial support has positive effect on the average efficiency of Slovak farms. Furthermore,

the average efficiency is better in the 2013, compared to the 2007. Former statement holds for the three model specifications presented in this paper. Such result suggests positive effect of the phasing-in period despite the fact that the financial support is not levelled across countries.

Acknowledgement
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Organic food and its position in retail stores in Slovak Republic

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Abstract
Factors such as healthy lifestyle, interest in green economy and a favorable impact on the environment continue to affect consumer behavior in relation to the food. Consumers tend to buy more and more organic food in Slovak Republic as well. Retail outlets are aware of consumers´ needs and therefore to their portfolio of products slowly but surely classify organic foods and so facilitate consumer purchases and contribute to better availability of organic food. The aim of this paper is to point out the secure position of organic food in retail in Slovak Republic. Purpose of the paper was supported by the primary information that has been obtained on the basis of the questionnaire survey implemented in the Slovak Republic. Based on the results obtained, we found out that most consumers buy organic products currently in various supermarkets and hypermarkets. A significant factor which influences the purchase of organic food is age. We can state that consumers in retirement age buy organic food at least. This fact is based on the assumption that their purchasing power is low and consumers in this age do not like to change their normal consumer behavior. On the contrary, more young consumers are in favor of these products and are much more accessible to the changes and use different ways to be sufficiently informed and compared with pensioners, their purchasing power is higher.

Key words: *bio products, consumer, organic food, retail, Slovak Republic.*

JEL Classification: *M31*

1. Introduction

Constantly growing awareness of the Slovak population and demands on product quality changes the consumer behavior. Slovak consumers increasingly trust in products that have a beneficial impact on the environment and these organic products slowly become established in retail chains as well. One of the factors why the Slovak consumers trust in buying organic food are different food cases which affect consumer behavior in relation to organic food. The previous consumers' problem was to find a way to get to the organic products, as in most cases they could be found only at organic farms, at a yard sale or in specialized stores. Present has been somewhat lenient and organic food are slowly, but surely building up a solid position in the retail sector. Only major obstacle of buying organic food by final consumers remains the price of these products, which is higher compared with ordinary food, as the costs of their production are higher.

Surveys of various agencies refer that demand for organic products in Slovak Republic is increasing. For this reason, organic products are slowly becoming established in the retail and the consumer gets to them easier.

Consumers are becoming more informed and their attention slowly draws to a healthy lifestyle and therefore in most cases more and more foods that are organically produced are beginning to appear on the tables at housholds, their production is environmentally friendly and therefore are suitable for consumers. Consumers' information are still not sufficient and it is the lack of information which is a kind of gap in consumer purchases of organic food.

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1.1 Characteristics of organic food

Under the term "organic" food we mean a food which has been made under production rules of organic farming. Thus, here we can also include meat, sausages, milk and dairy products, eggs, beer, wine, fruit and vegetables, bakery products and baby food. These are groceries originated as natural as possible, but in a controlled manner in organic and sustainable agriculture.[1]

Organic food is basically common food that may not be chemically treated, must not contain any genetically modified ingredients, while in the cultivation of organic crops there must not be used any pesticides and there must not be used any growth hormones or antibiotics by the animals. [2]

When there have to be followed all these rules and standards, the price of the product is increasing due to increasing labor and production costs. For the producers this means that they do not produce more products but the they produce more quality products.[3]

Quality is one of the major phenomenon, a driving power and at the same time motivating factor of application on the market of business legal entities through its competitive products. Nowadays we can understand quality as a summary of characteristics, whether a product or service which gives them the ability to meet the needs of consumers. According to ISO 9000, quality can be characterized as a set of characteristics of a product or service that are required and expected by customers.[4]

The present is marked by various trends of healthy lifestyle but also of the positive impact of organic farming. These facts have the effect that organic products are increasingly found in the shopping cart of Slovak households. Based on the survey conducted by GfK Slovakia, we can claim that the interest in organic foods is growing mainly in dairy products such as cheese, yogurt, as well as other products. Gradually, the other products, such as dried fruits, tea, flour, as well as edible oils are discovered and more wanted. The primary segment attacked by organic products is household with young housekeeper at the age up to 34 years. Based on the results of numerous surveys we can also claim, that organic products are purchased more in the cities than in the village, since rural consumers can grow organic products themselves.[5]

Consumers are looking for an easier way of getting to organic food. Retail outlets themselves are increasingly becoming aware of this interest in organic quality food. Their aim is to continually expand the range of products that meet these consumer demands. Various retail companies adapt their products to consumers. However, goods are not the only thing that they try to reach consumers with. They exploit the other methods to do it also. One of them is the arrangement of organic food in one place so that the consumer does not have to look for organic products throughout the whole sales area, but has everything in one place.[6]

2. Data and Methods

The aim of this paper is to point out the secure position of organic food in retail in Slovak Republic. As we can claim, based on different surveys in other European Union countries, organic food has already a stable position in the retail outlet but in Slovak Republic its place has to be consolidated yet. To obtain primary information a questionnaire survey was conducted on a sample of 228 respondents approached throughout the whole area of Slovak Republic.

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The questionnaire survey was aimed at determining whether Slovak households buy organic products, and especially on whether the products are purchased in specialized shops or they reach them easily and precisely by the purchase at a retail outlet.

The object of the investigation were the inhabitants of Slovak Republic. The questionnaire survey was divided into two parts. In the first part, we seek information about respondents and the aim of the second part was to obtain primary information about buying of organic food in the Slovak Republic.

The information that we used during the preparation of this paper can be divided into primary and secondary. The primary information becomes those acquired through our previous questionnaire survey, which was conducted in the period January-February 2016.

In evaluation of the questionnaire survey, there was used not just the graphic and tabular processing of the received data, but also the opportunity to test the statistical dependence between variables; when the following methods have been used − Pearson's chi-square test, Mann-Whitney U-test, Fisher's exact test and Cramer's contingency coefficient. For this reason, the following hypotheses were formulated:

H_1 H_0: There is no relationship between education and the purchase of organic food.
H_1: There is a relationship between education and the purchase of organic food.

H_2 H_0: There is no relationshiop between sex and the purchase of organic food.
H_1: There is a relationship between sex and the purchase of organic food.

H_3 H_0: There is no relationshiop between age and the purchase of organic food.
H_1: There is a relationship between age and the purchase of organic food.

H_4 H_0: There is no relationshiop between residence and the purchase of organic food.
H_1: There is a relationship between residence and the purchase of organic food.

3. Results and Discussion

Based on the information obtained from the questionnaire survey the most represented age group in the survey was between 18 and 25 years and it was up to 54 %. For the purpose of the survey, the sample of this age is very interesting because of the reason that this group has significant potential to change their consumer behavior and purchasing power is changing and significantly increases with their age. The smallest group in the survey were respondents over 66 years and they present only 3 %. In terms of research, this segment is not very important for us because it has some well established consumer behavior which it does not usually change and its purchasing power is low.

For this question we have set out the hypothesis, whichs' aim was to determine whether there is a relationship between the respondents' age and purchasing of organic food. Based on the results of Pearson chi-square test, we can conclude that there exists a relationship between age and purchase of organic food. This means that at the significance level of 5 % we accept hypothesis H1 and H0 is rejected. If the dependency was confirmed, our next step was to check if the variation is significant. Based on the results of the Mann Whitney U-test, we can claim that this dependency is not very significant. This fact is also confirmed by Crammers' test, which confirms that the mentioned dependence is not significant. (0.038147)

Our questionnaire survey further showed that from the total number of respondents were even 60 % females. Women are more careful and more informed in relation to the purchases for the houshold. Women also prefer a higher quality food and products which they bring into the home for their families and it is also due to the fact that they try to bring for their families only the best products.

Gender issue of our respondents was an another issue that has been analyzed through statistical tests. At this point, we have formulated a hypothesis that there is no relationship between the sex

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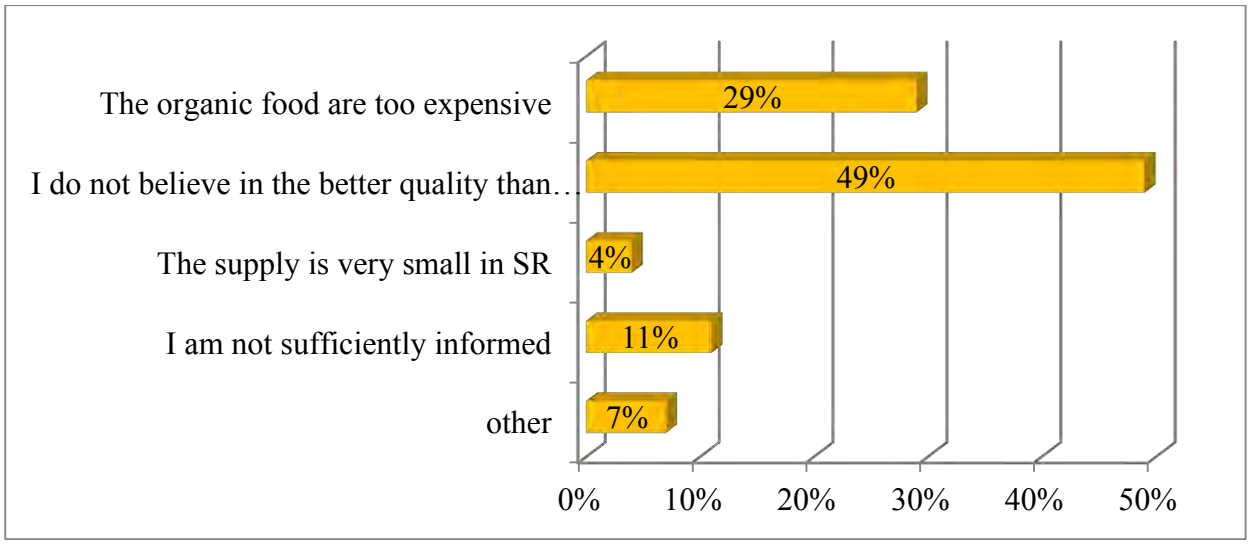
and purchase of the organic food. Based on the results of the Pearson chi-square test, we can conclude that the addiction has not been established and thus there is no relationship between the gender and the purchase of organic food. This is why we accept the H0 hypothesis. This fact we confirmed by using the Fisher's exact test as well, based on which we can actually confirm that the dependence between variables does not exist.

A significant factor affecting the consumer purchase is their income. From all surveyed respondents 47 % said that they are employed and thanks to their professional activity they earn income. 37 % from the remaining respondents were students. Education is a factor which at some extent can influence consumer purchase. Even 47 % from our respondents had completed higher education, whether first, second or third degree.

Based on primary information obtained through the questionnaire survey we can claim that 97 % of respondents know the term "organic food". But it is worse with the purchase of these products. 47 % of respondents which were asked the question relating to the purchase of these products said that in their household they do not buy organic food.

The main reason why they do not buy organic food is mainly their lack of confidence in the quality of this food. Consumers believe that the quality of organic food is the same one as of the ordinary food. The other reason is the high price of these products as well as the lack of awareness of consumers. One of the options which respondents could choose was also that the offer of organic food in Slovak Republic is too small and also that the consumers of organic food are not sufficiently informed. One of the reasons why they do not buy organic food is also their high price. Up to 29 % of respondents claim that organic food is too expensive. (Figure 1)

Figure 1: The reasons for not buying organic food



Resource: Own processing, 2016.

The remaining 53 % of respondents who buy organic food see as their main positives that this food is tastier, better, more environmentally friendly, but also that it is slowly becoming part of the lifestyle of consumers.

The frequency of purchases varies, but most respondents said that they buy organic food occasionally. Only 34 % of respondents claim that they buy organic food regularly.

Consumers make purchases in different places but most often they buy organic products in supermarkets, hypermarkets − in retail operations. This alternative was chosen by 57 % of respondents. High percentage at responses had also shops with organic food and healthy eating. One of the options of getting consumers to organic food are also farms or yard sale of small farmers, who in this way sell their products. (Figure 2)

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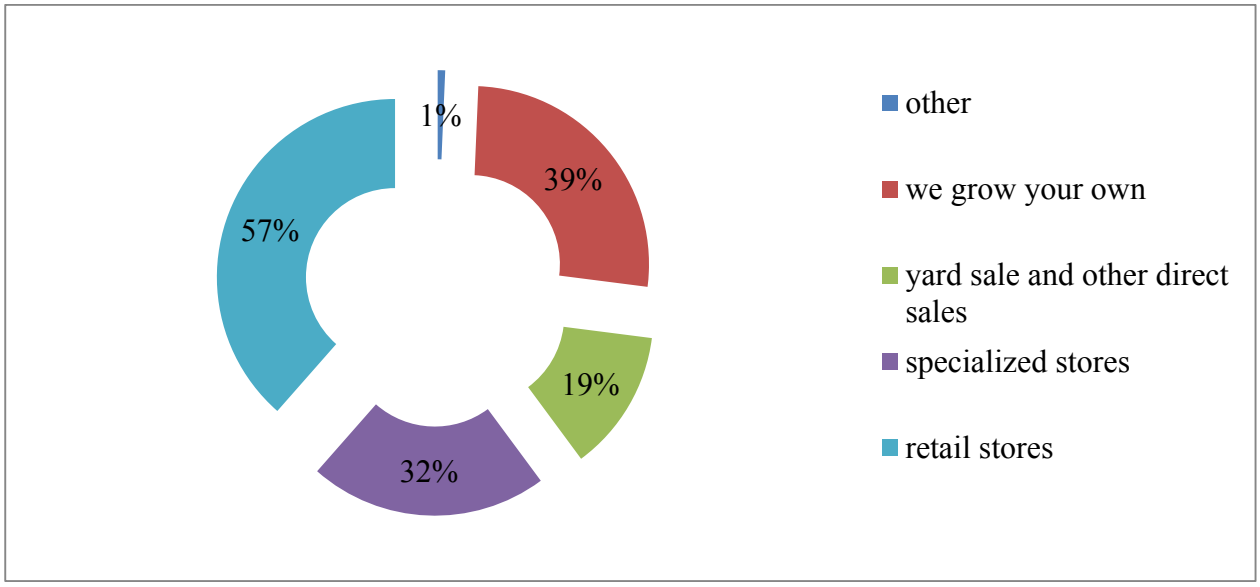
Figure 2: The point of purchase of organic foods



Resource: Own processing, 2016.

One way of getting consumers to organic food is the fact that they can grow them themselves. This alternative, however, tend to favor families living in the villages, which have better access to the cultivation of this type of crop. From the surveyed respondents up to 58 % live in a village.

For this issue we also established hypothesis whose aim was to determine whether there is a relationship between the individual purchases of organic food and respondents' residence. Based on the results of the Pearson chi-square test we can claim that there is no correlation between the purchase of organic food and respondents' residence. This means that organic food can be equally bought by a customer in the countryside, but also in the city.

One of the factors that influence consumer purchase in relation to the organic food is the awareness of consumers. Consumers enrich their awareness with information which they find on the Internet. This alternative was chosen by 64 % of respondents. A significant factor that can influence consumer purchase in relation to organic food are also the references from friends. This option was chosen by 16 % of our respondents.

Slovaks proudly manifest the fact that they are patriots in buying of Slovak products. Therefore, the country of origin of the product is significant factor affecting consumer purchase. 35 % of respondents said that country of origin affects them when buying organic food; but 6 % of respondents chose the option that the country of origin of the product never affects them when buying organic products.

The main reasons which would force the Slovak consumers to purchase organic food more is particularly the lower cost of organic food (39 %). Another option selected by respondents was if Slovak Republic had better product availability (27 %), as well as broaden of the width of the range of products (16 %). As it was mentioned above, income is economically significant factor affecting consumer purchase. For this reason, 18 % of respondents chose the option that in the case of increased household income, they would increase the frequency of their purchases of organic food as well.

Consumers can see some advantages and disadvantages when buying organic food. Consumers' views differ in relation to the purchase of organic food. Certain part of consumers prefer this food

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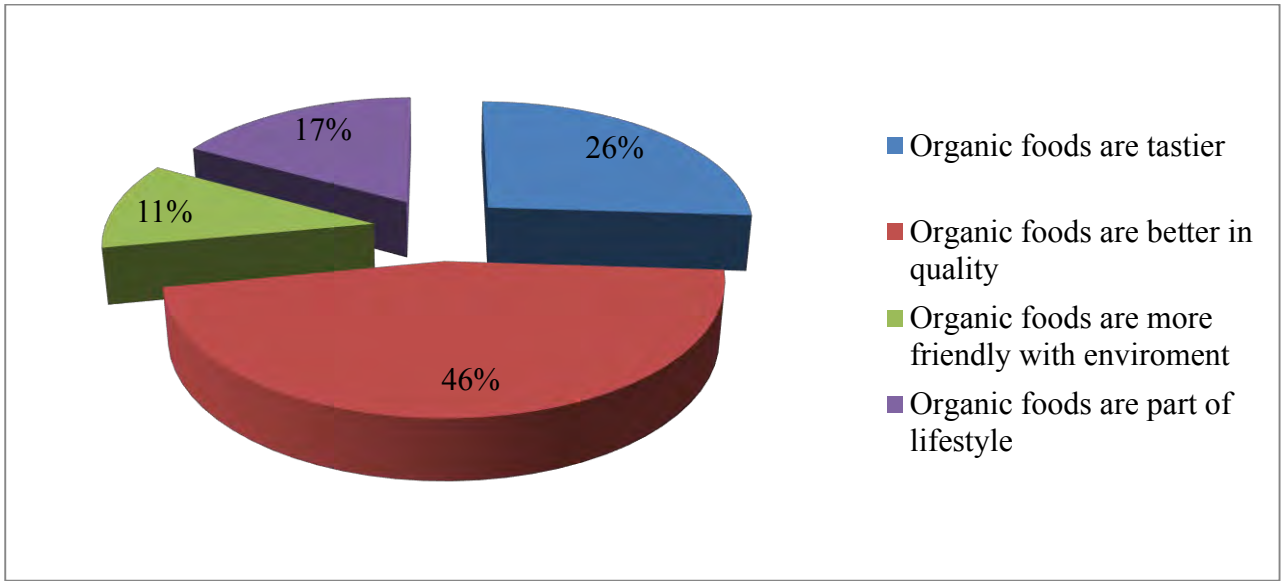
to another food, they claim it is tastier, better quality, but emerging trends is also a healthy lifestyle, which gives priority to consumption of these products. (Figure 3)

Figure 3: Advantages of organic foods



Resource: Own processing, 2016.

On the other hand, there are some consumers who are skeptical of organic food and they do not believe that the quality of organic food might differ from the quality of other food. The price is very significant factor, which influences the purchase of organic food.

4. Conclusion

The aim of this paper was to point out the secure position of organic food in retail in Slovak Republic. Consumers see many positives in buying of organic food and also they can distinguish them from conventional foods. But on the other hand, we can also find opponents of these products who do not believe that the quality of this food can vary and could be much better than the quality of ordinary food.

Based on primary data that we obtained through the questionnaire survey, we can claim that we have met the aim of the present paper, because up to 39 % of all respondents stayed that they purchase the organic food only in various supermarkets and hypermarkets. The second most frequently chosen answer was that they grow these products themselves (26 %). The downside for consumers, however, is the fact that not everyone can grow their own products, as consumers do not have all the essentials to do so.

One of the fundamental factors affecting the consumers in a negative direction is the high price of these products compared to the prices of another food. As another factor that affects consumers in buying of organic food we can mention the lack of consumer awareness of what the positives organic food brings.

Producers of organic food should their clients, but also the future customers inform a little more and so get organic food and their beneficial effects to their awareness. It is therefore necessary to influence the consumers' decision by appropriate advertising, but also by delivering the necessary information about the products that are organically produced and their production has no negative impacts on the environment.

Organic food in the future will certainly be part of the diet of each consumer. In the past, the bioproduct was almost everything that the consumer has grown himself. This trend is once again becoming living and consumers are slowly returning to the fact that organic food is gaining on their tables.

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The development of small and medium-sized enterprises in Nitra Region

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Abstract
Small and medium-sized enterprises have had a dominant position in most economies in the world and constitute the most important part of them. According to the European Commission, 98% of the companies are small and medium-sized and provide jobs to 90% of the employed population. Small and medium-sized businesses have become very popular among the majority of entrepreneurs for a number of reasons. The main advantage of this type of business is flexibility and fast, flexible reaction to market demands. Micro, small and medium-sized enterprises have the ability to operate very dynamically and flexibly, and to specialize in their fields. In most cases, these companies have a very simple and transparent organizational structure, and they are managed by the entrepreneurs themselves. On the other hand, we cannot ignore the negatives that are associated with small and medium-sized enterprises. They often face the lack of capital, which can lead to other problems, such as limited access to foreign markets, low possibility of obtaining and maintaining highly specialized staff, etc. The major objective of this paper is to assess the level of small and medium-sized enterprises in Nitra Region, with emphasis on specifications, types and locations of SMEs.

Key words: *undertakings of small and medium-sized enterprises, microenterprises, business conditions, entrepreneur, employment*

JEL Classification: *M130, M000, M190*

1. Introduction

It is not a coincidence that the micro, small and medium enterprises are considered as the pillar of economy in many countries. From the historical perspective, more significant attention has been paid to small and medium-sized businesses since 1971, when the so called Bolton Report was formed. Since then, their number has been growing at an irreversible pace. The evidence of this is the fact that over 90% of all enterprises in Europe are small and medium-sized, employing more than 60% of the working population, and their share in the GDP is from 50% to 70%, depending on the country[1].

Small and medium-sized enterprises have had a dominant position in Slovakia for several years. After the accession to the European Union, the pressure on their competitiveness, flexibility and flexibility to react to changes in the environment has significantly increased. Structure, size, lines of business have changed in the recent years. The subject of this paper is to describe and capture the status of small and medium-sized enterprises in Slovakia, especially in Nitra Region. Slovakia is one of the smaller countries in Europe, but the diversity of businesses is significant.

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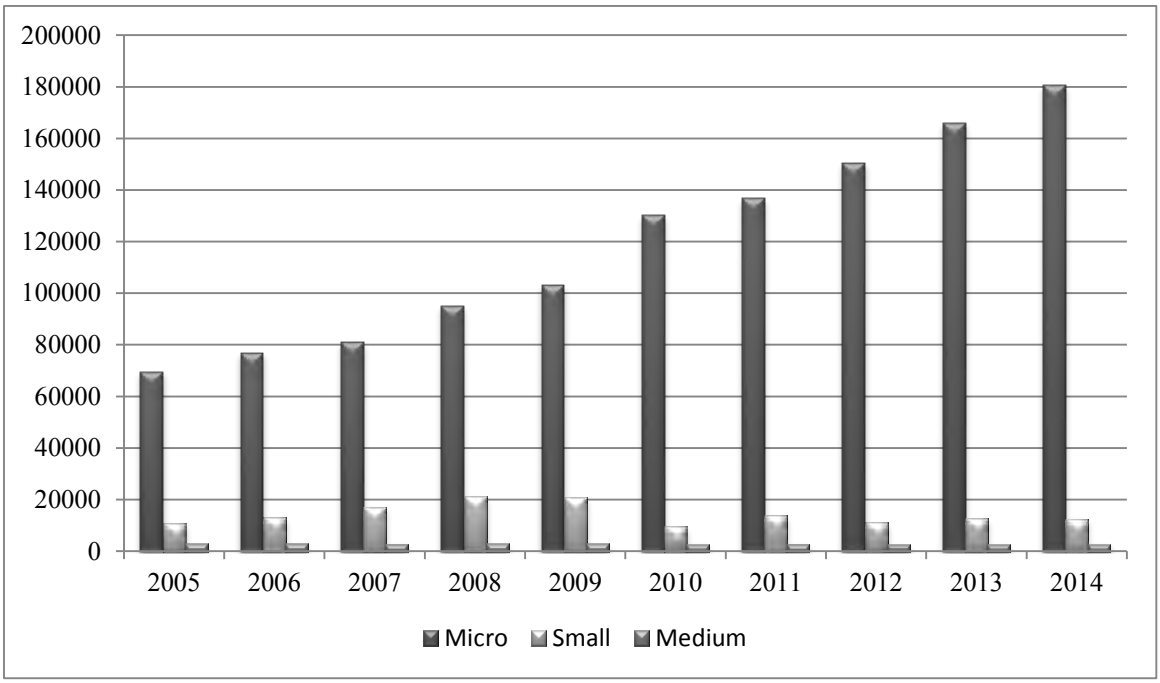
1.1 The development of small and medium-sized enterprises in the Slovak Republic and Nitra Region

The Nitra Self-governing Region is one of the eight regions in the Slovak Republic. It is located on the area of 6,344 km^2, and according to the last census, it has a population of 689,564. This region lies in the southwest of the Slovak Republic and borders Hungary in the south. The location and nature of the lowland makes it one of the warmest and driest regions in Slovakia. The Nitra Self-governing Region has important highway connections with major cities like Bratislava or Vienna, it lies on the Danube waterway, and a number of important railway routes pass through it as well. This region is administratively divided into seven districts, Nitra, Topoľčany, Zlaté Moravce, Šaľa, Nové Zámky, Levice and Komárno[2].

Chart 1 Development of the number of small and medium-sized enterprises in Slovakia



Source: SBAGENCY: Report on the status of small and medium enterprises in Slovak Republic. [online] [quoted 20.2.2016] Dostupné z <http://www.sbagency.sk/sites/default/files/sprava_o_stave_msp2014.pdf>

From the above statistics, it is clear that Nitra Region does not belong to the largest regions. The Population puts it in 4th place, immediately after Žilina Region. We can find 354 municipalities in here, but only 15 towns, which is one of the smallest numbers. This fact has also an impact on the low level of urbanization (46.03), i.e. the proportion of the population living in towns to the total population, which is well below the national average (54.35).

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Table 1 General characteristics of regions in Slovakia in 2011

Region	Area in km²	Population as of 31 12 2011	Population density per km²	Municipalities		Level of urbanization
				Total	Towns	
Bratislava	2 053	606 537	295,5	73	7	81,15
Trnava	4 147	555 509	134	251	16	47,67
Trenčín	4 502	594 186	132	276	18	56,24
Nitra	**6 344**	**689 564**	**108,7**	**354**	**15**	**46,03**
Žilina	6 809	689 601	101,3	315	18	49,39
Banská Bystrica	9 454	660 128	69,8	516	24	53,30
Prešov	8 974	815 806	90,0	665	23	48,35
Košice	6 755	792 991	117,4	440	17	55,74
Total in Slovakia	49 036	5 404 322	110,2	2 890	138	54,35

Source: STATISITICAL OFFICE: General Characteristics. [online database] 22.11.2012. [qout. 15.2.2016] Available from <http://portal.statistics.sk/showdoc.do?docid=2213>

1.1.1 SMEs in Nitra Region

The following table provides general information on small, medium and large enterprises. At the same time, it distinguishes the public sector (local government or municipal ownership) and private sector (domestic ownership, the ownership of cooperatives, associations, political parties and churches). SMEs have a considerable importance in Nitra Region, as they constitute 99.6% of all enterprises, 97.3% small and 2.3% medium-sized enterprises. Out of the 15,449 enterprises operating in this region, only 54 have more than 250 employees. Companies with domestic ownership dominate in Nitra Region.

Table 2 Number and ownership of SMEs in Nitra Region in 2011

Sector, ownership	Number	Number of employees					
	Total	Small		Medium		Big	
		Number	%	Number	%	Number	%
Companies in total	15 449	15 037	97,3	358	2,3	54	0,3
Sector							
Public	83	57	68,7	22	26,5	4	4,8
Private	15 366	14 980	97,5	336	2,2	50	0,3
Ownership							
Foreign	3 272	3 157	96,5	89	2,7	26	0,8
International	696	661	95,5	31	4,5	4	0,6

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Source: STATISTICAL OFFICE: Enterprises in the Nitra region by economic activity and size structure of 31.12.2011.. [online] 29.3.2012. [quot. 15.2.2016] Available from <http://portal.statistics.sk/showdoc.do?docid=45015>

The following table shows the development of small and medium-sized enterprises in different regions of the Slovak Republic in the years between 2005 and 2011. The highest number and at the same time the most significant rise we recorded in Bratislava Region, there were 54,204 small and medium-sized enterprises in 2011. In Nitra Region in 2005, we had the smallest number of small and medium-sized enterprises, around 8,000. However, in the following years we could see the fastest growth in the number of small and medium-sized enterprises from all of the regions. It reached its peak in 2011, when we recorded 15,836 micro, small and medium-sized enterprises. This figure puts Nitra Region in third place. In recent years, we have witnessed a sharp increase in SMEs, mainly due to the improvement of the infrastructure (construction of R1, road repairs). Thus, we witness an inflow of foreign and domestic investment and an increase of the overall attractiveness of the business environment.

Table 3 Number of SMEs in the Nitra Self-governing Region by sectors

Sector	Number	Number of employees					
	total	small		medium		big	
		number	%	number	%	number	%
Number of companies	15 449	15 037	97,3	358	2,3	54	0,4
Agriculture, forestry, fishing	654	588	89,9	66	10,1	-	-
Mining and quarrying	12	11	91,7	1	8,3	-	-
Industrial production	1 718	1 544	89,9	141	8,2	33	1,9
Electricity, gas and cold air supply	32	29	90,6	3	9,4	-	-
Water supply	78	71	91,0	6	7,7	1	1,3
Building industry	1 203	1 170	97,3	30	2,5	3	0,2
Wholesale and retail	5 055	5 011	99,1	38	0,8	6	0,1
Transport and storage	1 010	987	97,7	21	2,1	2	0,2
Accommodation and food service	491	487	99,2	4	0,8	-	-
Information and communication	675	672	99,6	2	0,3	1	0,1
Financial and insurance activities	57	56	98,2	1	1,8	-	-
Activities in the field of real estate	688	685	99,6	3	0,4	-	-
Professional and scientific activities	1 918	1 909	99,5	9	0,5	-	-

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Administrative activities	802	780	97,3	18	2,2	4	0,5
Education	117	116	99,1	1	0,9	-	-
Health care	617	604	97,9	9	1,5	4	0,6-
Arts and recreation	179	178	99,4	1	0,6	-	-
Other activities	143	139	97,2	4	2,8	-	-

Source: STATISTICAL OFFICE: Enterprises in the Nitra region by economic activity and size structure of 31.12.2011. [online]. 29.3.2012. [cit. 20.2.2016] Dostupné z <http://portal.statistics.sk/showdoc.do?docid=45014>

The above data of the Statistical Office shows the general number of undertakings in different districts of Nitra Region, indicating the type of ownership. Most businesses, 4297, we register in the Nitra District, since it is the most developed area. Part of it is Nitra, the county seat and the largest town. It is followed by the District of Komárno and the District of Nové Zámky, with 2,863 enterprises, where the priority is mainly the engineering and processing industries, with long history and tradition. On average, 99.5% of the companies are in private ownership. Most businesses, with a predominance of foreign capital (up 45.2% of companies) and international capital (5% of companies), are recorded in the District of Komárno, which is related to its geographical location. In a large extent, they cooperate mainly with Hungary. The smallest number of enterprises is registered in the District of Zlaté Moravce; based on the available statistics, it is the least developed area of Nitra Region.

2. Data and methods

The principal aim of this paper is to review and analyze the small and medium-sized enterprises in Nitra Region. Given this primary objective, we focused our attention on small and medium-sized enterprises and the related evaluation of the business environment. It was created by using mainly the data of the Statistical Office of the Slovak Republic, reports issued by the National Agency for Development of Small and Medium Enterprises, as well as the information from the portal of the Nitra Self-governing Region.

3. Results and discussion

The number of SMEs in Slovakia grew each year (see Annex 1). While in 1993 there were 28,522 enterprises in our territory, at the end of 2011, we could talk about 153,881 enterprises, which represented more than a fivefold increase. The graph shows that the number of enterprises in Slovakia grew at a very slow pace until 2003. The year 2004 became a milestone, the Slovak Republic joined the European Union, which resulted in an extreme increase in the number of enterprises due to the increased capital inflows, the development and promotion of business environment, and at last but not least, the free movement of labour. The SMEs have clear majority within the companies operating in the Slovak Republic, thanks to the number of advantages that are typical for them. This fact is confirmed by the following chart. The number of these enterprises increased from 58,930 to 153,283 between 2002 and 2011, with the largest representation of microenterprises (more than 89% of all SMEs). Medium-sized companies are stable components of the Slovak economy. The most significant change can be observed at the turn of 2009 and 2010, when the number of microenterprises increased from 102,926 to 130,144. It was due to the recovery of the economy after the financial crisis. Another important factor was the reduction in employment (1.1%), the adoption of the package of economic

measures by the Government of the Slovak Republic, and the increased use of the Euro as the national currency in the territory of Slovakia, which led to an increase in exports by 16.4%[3].

Nitra region itself is in most nationwide business statistics in diameter. The only exception is the growth rate of small and medium-sized enterprises. While in 2005 occupies the last place in the course of six years it has been recast to third place in the number of SMEs. Also from this fact, it is clear that the business environment in the Nitra region has an improving tendency. Business of small and medium enterprises in Slovakia has a long history. Compared with other countries, we are still witnessing a growing trend that is in Europe after the debt crisis that is a rarity in most of European countries. The most important task therefore remains on improving the attractiveness and use all the potential of Nitra region. Attention should focus particularly on agricultural potential, geographical location or orientation of science and research. Only in this way can Nitra Region build a sustainable competitive advantage not only in Slovakia but also in comparison with other countries and thereby mobilize domestic and foreign entrepreneurs.

4. Conclusion

Slovakia does not belong to the big countries of Europe; nevertheless, even here we can see the differences between regions. From our statistics, it is clear that Nitra Region does not belong to the largest regions. The Population puts it in 4th place, immediately after Žilina Region. Nitra Region is distinctive for the low number of towns and a large number of villages, which clearly contributes to the low level of urbanization. In Nitra Region, it is clear that the population living in towns is below average, relative to the national average. The Nitra Self-governing Region might be termed as a region of small and medium-sized enterprises. The development of small and medium-sized enterprises in the Nitra Self-governing Region is untypically dynamic. The Government of the Slovak Republic should not rely only on the ongoing growth in the number of enterprises and take it for granted, but it should undertake proactive steps to ensure that this situation will remain sustainable. A micro-loan programme to the general public and the facilitation of the access to the financial resources from the EU would be helpful. Most of the small and medium-sized enterprises, by their nature, work under constant stress every day. Due to this fact, we propose reducing the administrative burden on businesses and on the other hand, the introduction of electronic communications in all accessible areas. There are also frequent problems in the field of human resources. Unemployment, whether in Slovakia or in Nitra Region, is still high, yet companies are struggling with the lack of experts and qualified workforce. Therefore, we propose that, especially, the authorities of the state administration should pay more attention to linking theory with practice, linking learning with the real problems of entrepreneurs, and in particular, the promotion of vocational schools. Almost all of the business units operating here can be classified as SMEs. As far as the business areas in Nitra Region are concerned, we are witnessing average values. The surprise is the agricultural sector, which should dominate in the region, as it could be expected as a result of the agricultural conditions and strong professional agricultural background. Nitra Region achieved its best results in the field of transport and information, due to the large number of secondary schools focusing on transport. On the other hand, there are obvious shortcomings in terms of accommodation and food, which puts Nitra Region in penultimate place.

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The use of HRV analysis in the marketing research

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Abstract
The autonomic nervous system (ANS) is the portion of the nervous system that controls the body´s visceral functions, including the action of the heart. It is well known that mental and emotional states directly affects the heart rhythms. The analysis of the heart rate variability can be very useful also in marketing, because study of the heart rate variability is an objective and non-invasive tool to explore the dynamic interactions between physiological and emotional processes. The heart rate variability patterns are responsive to emotions and heart rhythms tend to become more ordered during positive emotional states. The present paper is the pilot study and it shows consumer reactions on selected alcohol commercials and compares changes in heart rhythms with conscious statements of respondents about that, how they felt about the selected commercials. It was found out that consumers with high neuroticism react more emotionally than respondents with low level of neuroticism. There are also differences between males and females.

Key words: *heart rate variability, autonomic nervous system, emotions, neuroticism, consumer*

JEL code: *M31*

1. Introduction

The autonomic nervous system (ANS) is the portion of the nervous system that controls the body´s visceral functions, including the action of the heart. We know that mental and emotional states directly affects the heart rhythms. While the rhythmic beating of the healthy heart at rest was once believed to be monotonous and regular, now we know that the rhythm of the heart at rest is actually irregular (McCraty et al., 2001). These beat-to-beat variations in heart rate are in fact very informative. Heart rate variability is a very good indicator, primarily of health problems and risks. But the analysis of the heart rate and heart rate variability can be very useful also in marketing research. By the functioning of the heart we can observe how consumers react on various tools of the marketing communication. The study of the heart rate variability is an objective and non-invasive tool to explore the dynamic interactions between physiological and emotional processes. This paper is the pilot study and our main aim is to show how the HRV biofeedback (primarily psychological tool) can be also used in marketing. In neuromarketing research the functioning of the brain is on the first place but with the knowledge of functioning of the autonomic nervous system we can tell that the heart is as much important as the brain. The theoretical base of this paper we consider as very important for understanding how the heart works and how the heart and brain are connected.

1.1 The autonomic nervous system and the functioning of the heart

The heart plays a central role in the generation of emotional experience, and therefore, in the establishment of psychophysiological coherence. The heart is the most powerful generator of rhythmic information patterns in the human body (McCraty et al., 2001). The functioning of the heart is joined not only with the central nervous system but also with the activity of the autonomous nervous system.

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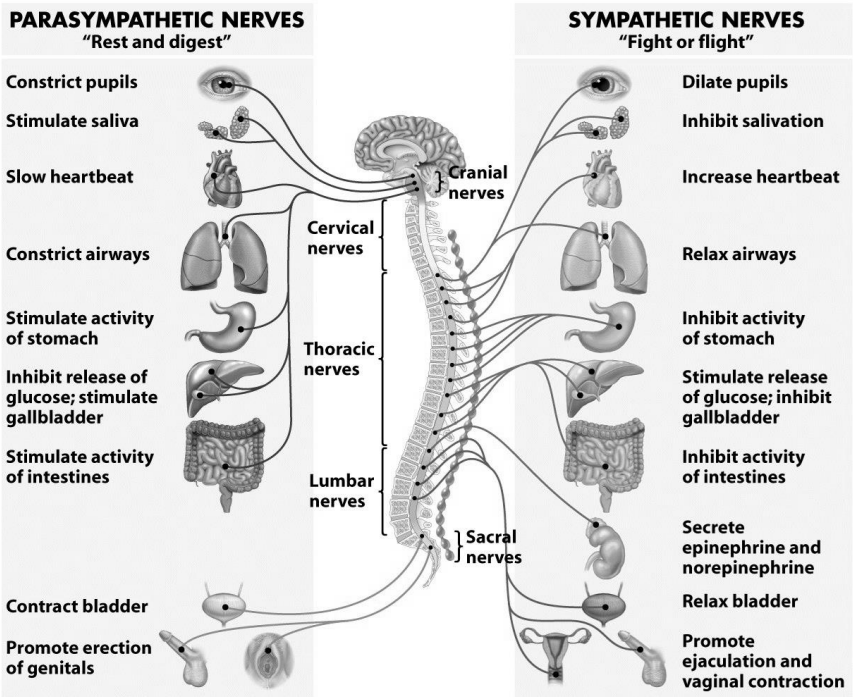
The autonomic nervous system (ANS) is a division of the peripheral nervous system that influences the function of internal organs (Figure 1). The autonomic nervous system is a control system that acts particularly unconsciously and regulates the bodily functions such as the heart rate, respiratory rate, pupillary response, urination, and sexual arousal. This system is the primary mechanism in control of the fight-or-flight response and the freeze-and-dissociate response (Schmidt &Thews, 1989). The main function of ANS is to keep the homeostasis and to assign the adaptation of individual organs to changing conditions of the environment. The functioning of ANS is regulated on the level of the brain stem and the spinal cord which are subordinated to the hypothalamus as the most crucial control element. The centres for the basic vegetative functions and reflexes are located in the reticular formation. On the level of the hypothalamus, these reflexes are connected to the more complex patterns which are modulated particularly by the limbic system (Čihák, 2004).

The autonomic nervous system has two branches: the sympathetic nervous system and the parasympathetic nervous system.The sympathetic nervous system is often considered to be the "fight or flight" system, while the parasympathetic nervous system is often considered to be the "rest and digest" or "feed and breed" system (Pocock, 2006). Both systems work antagonistically, where one system activates a physiological response and the other inhibits it. The sympathetic nervous system innervates all parts of the heart. The stimulation of the sympathetic nervous system releases the noradrenalin from the nerves terminations. The functioning of the sympathetic increases the heart rate (Perrson, 1996). The functioning of the parasympathetic nervous system decreases the heart rate. The changes in the activity of the parasympathetic fades away very quickly, so they mediate the quick changes of the heart rate from the beat to beat. The activities of both systems are joined and dependent and their effect on the heart is the result of the simultaneous changes (Javorka, 2001). Most autonomous functions are involuntary but they can often work in conjunction with the somatic nervous system which provides voluntary control.

Figure 1:The autonomic nervous system



Source: http://www.uic.edu/classes/bios/bios100/lectures/ANS.jpg

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1.1 The heart rate, the heart rate variability, personality and emotions

The heart rate is the speed of the heartbeat measured by the number of contractions (beats) of the heart per minute. The heart rate can vary according to the body's physical needs. It is usually equal or close to the pulse measured at any peripheral point. The normal resting adult human heart rate ranges from 60-100 beats per minute (bpm). A fast heart rate, defined as above 100 bpm at rest is called tachycardia. Bradycardia is a slow heart rate, defined as below 60 bpm at rest. During sleep a slow heartbeat with rates around 40-50 bpm is common and is considered as normal. Systolic blood pressure should be around 90-120 and diastolic blood pressure should be around 60-80 mm Hg. These values are well known because they were derived from a sample of the population in past epidemiological research (Altini, 2015). When activity in the sympathetic branch increases, heart rate goes up. When this activity decreases, heart rate goes down. Conversely, when parasympathetic activity decreases, heart rate goes up and vice versa. The parasympathetic branch acts faster than the sympathetic branch and it can therefore increase and decrease the heart rate with the greater precision. (Aldo, 2014). The heartbeat increases in the state of arousal and decreases with the upcoming calming (Nakonečný, 2000).

The heart rate variability (HRV) is a measure of the continuous interplay between sympathetic and parasympathetic influences on heart rate that yields information about autonomic flexibility and thereby represents the capacity for regulated emotional responding (Appelhans&Luecken, 2006). Heart rate variability (HRV) is a physiological marker of how we experience and regulate our emotions. The heart rate variability is relatively easy to measure. The heart rate means the number of beats per minute, the heart rate variability means the number of seconds that elapse between one heart beat and the next one (Figure 2). This is called the interbeat interval (RR interval). When we calculate HRV, we don't care about the average RR, but rather about its variability. We are interested in how much the RR fluctuates from each heart beat to the next. The parasympathetic branch is very fast, so sudden changes in RR can only be mediated by this branch. Thus, greater HRV equals more parasympathetic influences on the heart, and thus, more flexible emotional responding (Aldo, 2014).

The heart rate variability is defined as changes in the duration of consecutive cardiac cycles (heartbeats). Cardiac cycles may be measured by electrocardiography or electrocardiogram (ECG or EKG). On the ECG, the pattern of a cardiac cycle has four major parts: a P wave (which represents the electrical vector spreading from the right atrium to the left atrium during atrial depolarization), a QRS complex (which represents depolarization of the right and left ventricles), a T wave (which represents repolarization of the ventricles), and a U wave (which represents repolarization of the papillary muscles). HRV is measured as the variation in duration between the R peaks on the QRS complexes between consecutive cardiac cycles (Helschein, 2015).

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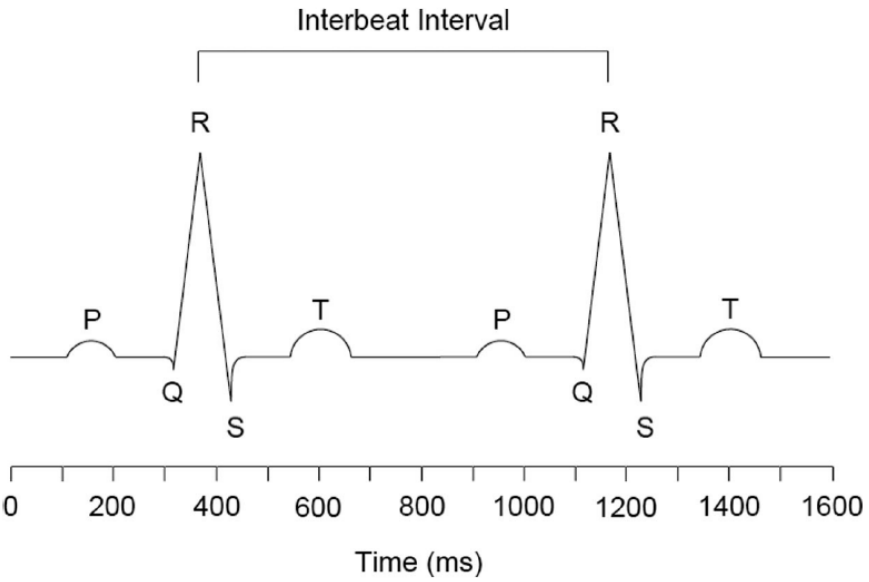
Figure 2: Interbeat interval (represents two heartbeats)



Source: Appelhans, B. M., &Luecken, L. J. (2006). Heart Rate Variability as an Index of Regulated Emotional Responding. p. 232.

HRV reflects the degree to which cardiac activity can be modulated to meet changing situational demands. Although HRV is influenced by numerous physiological and environmental factors, two are particularly prominent and of psychophysiological importance: the influence of the ANS on cardiac activity and ANS regulation by the central autonomic network (Appelhans&Luecken, 2006). In HRV it is important to look at our own baseline and monitor deviations from this baseline. It is not possible to compare heart rate variability of several people because it has no significance. Our baseline HRV is affected by some factors that we cannot easily measure (for example inborn factors), other factors that we cannot change (age, gender, etc.), and factors that can be influenced (health, lifestyle, BMI, weight, etc.) (Altini, 2015).

The two autonomic branches (sympathetic and parasympathetic) regulate the lengths of time between consecutive heartbeats, or the interbeat intervals (RR), with faster heart rates corresponding to shorter interbeat intervals and slower heart rates corresponding to longer interbeat intervals (Appelhans&Luecken, 2006). The heart rate variability reflects the moment-to-moment output of the central autonomic network and an individual's capacity to generate regulated physiological responses in the context of emotional expression (Thayer & Lane, 2000; Thayer &Siegle, 2002).

Many factors affect the activity of the autonomic nervous system, and therefore influence the heart rate variability. The research has shown that one of the most significant factors that affect changes in the heart rhythm are feelings and emotions. When our varying heart rate is plotted over time, the overall shape of the waveform produced is called the heart rhythm pattern. The research has found that the emotions we experience directly affect our heart rhythm pattern. In general, emotional stress – including emotions such as anger, frustration, and anxiety (negative emotions) – gives rise to heart rhythm patterns that appear irregular and erratic. The HRV waveform looks like a series of uneven, jagged peaks (an example is shown in the Figure 3). It is known as the incoherent heart rhythm pattern. In contrast, positive emotions send a very different signal throughout our body. When we experience positive emotions such as appreciation, joy, care, and love, our heart rhythm pattern becomes highly ordered, looking like a smooth, harmonious wave (an example is shown in the Figure 3). This is called a coherent

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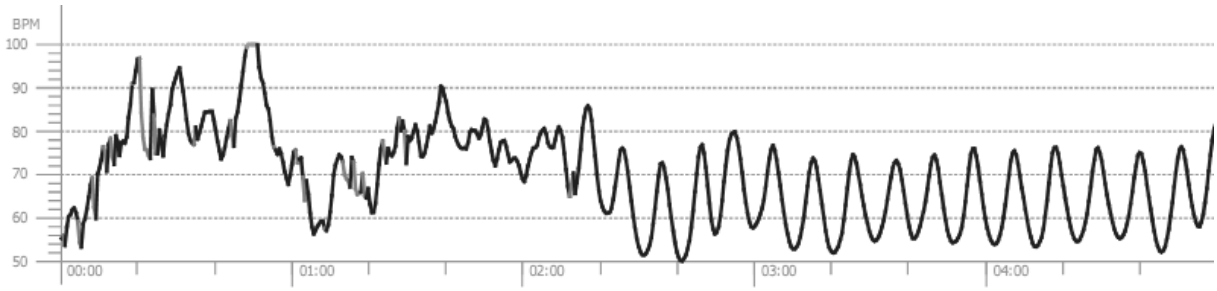
heart rhythm pattern. When we are generating a coherent heart rhythm, the activity in the two branches of the ANS is synchronized and the body's systems operate with increased efficiency and harmony. Positive emotions actually help our body's systems synchronize and work better (McCraty et al., 2001).

Figure 3:Incoherent and coherent heart rhythm pattern



Source: own elaboration according to McCraty, R., Atkinson, M., &Tomasino, D. (2001). *Science of the Heart. Exploring the Role of the Heart in Human Performance*. p. 18.

As we described above, the emotional response involves almost all physiological systems of the body – the central and the autonomic nervous system, internal organs, endocrine glands, etc. The most common classification of emotions separates emotions to positive and negative emotions. Many studies have shown that in humans emotions are closely connected with consciousness, they have both a physiological and psychological nature, and together they form the emotional personality traits. Emotional traits are the most stable personality characteristics and they are closely connected with the temperament (Prokopenko, 2012).

Some studies investigated whether introverts and extroverts differ in cardiovascular activity. The results are mixed and inconclusive (Hogan et al., 1997). Many authors found no comparable differences in heart rate or heart rate variability. However, some of them observed higher heart rate in introverts than in extroverts in all conditions of an experiment on visual vigilance (Hogan et al., 1997). Prokopenko (2012) found out that the level of introversion-extroversion has the most prominent influence on the functional reserve of the body. In introverts, the activity of cardiovascular and respiratory systems declines.

2. Data and Methods

The main aim of this paper is to examine changes in heart rhythms of chosen consumers during watching two selected alcohol TV commercials and to find out if changes in heart rhythms correspond with conscious statements of consumers about selected commercials.

The sample consists of 20 volunteers. All probands were carefully selected from 100 participants. We chose 5 males with high neuroticism, 5 males with low neuroticism, 5 females with high neuroticism and 5 females with low neuroticism (based on Eysenck personality questionnaire EPQR-S). All probands gained similar score in intelligence (based on Cattell personality questionnaire 16 PF) and have higher, abstract intelligence. They are all students on the same university, they are similar age (20-21 years old), and they are healthy, non-smokers, medium physically active. All probands are from Slovakia and live in Slovak Republic.

The two TV commercials for alcohol were selected. First takes 2:02 min and second takes 1:01 min. The main aim of the first commercial is to evoke touching emotion and of the second is to evoke amusement.

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We compared changes in heart rate and heart rate variability with conscious statement of probands about the commercials. For recording the heart rate and heart rate variability the emWave Desktop HRV biofeedback was used.

Table 1: Conscious statement of probands about first commercial

		Commercial 1		
		Not touching	Touching	Total
Neuroticism	Low	4	6	10
	High	3	7	10
Total		7	13	20

Source: author's calculations

Table 2: Conscious statement of probands about second commercial

		Commercial 2		
		Not funny	Funny	Total
Neuroticism	Low	5	5	10
	High	3	7	10
Total		8	12	20

Source: author's calculations

In first commercial it was found out that 7 probands consider it as not touching (4 probands with low neuroticism and 3 probands with high neuroticism), 13 probands consider it as touching (6 probands with low neuroticism and 7 probands with high neuroticism).

In second commercial it was found out that 8 probands consider it as not funny (5 probands with low neuroticism and 3 probands with high neuroticism), 12 probands consider it as funny (5 probands with low neuroticism and 7 probands with high neuroticism).

We also observed changes in heart rate and heart rate variability of probands during watching the TV commercials. It was recorded a mild increase of the heart rate in 9 probands that considered the first commercial as touching (2 probands with low neuroticism and 7 probands with high neuroticism) and also an increase of the heart rate in all 12 probands that considered the second commercial as funny (3 probands with low neuroticism and 9 probands with high neuroticism).

We can conclude that respondents with high level of neuroticism (emotional lability) react more emotionally than respondents with low level of neuroticism (emotional stability).

We detected changes in heart rate also in probands who did not consider commercials as funny or touching. The coherent heart rhythm pattern was observed in all probands. We suppose it is because both commercials evoked positive emotions, so it could be the evidence that positive emotions smooth the heart patterns.

With the use of Student´s t-test we tested differences between males and females. It was found out that females react more emotionally than males. Much research shows that women are more emotional and that their emotions work a little bit different than those in men. Women are more emotional in every sphere of life, so we can assume that female customers are more emotional, as well.

3. Results and Discussion

During our research it was observed an increase of the heart rate in 9 probands that considered the first commercial as touching, and also an increase of the heart rate in all 12 probands that

considered the second commercial as funny. More emotionally reacted probands with high level of neuroticism. These results copy the general knowledge about personality and temperament characteristics of individuals. These findings could be used as the supplement of the research of Prokopenko (2012) who found out that the level of introversion-extroversion has the most prominent influence on the functional reserve of the body. In introverts, the activity of cardiovascular and respiratory systems declines. Introversion-extroversion is one of the three Eysenck´s dimensions of personality, neuroticism is the second. We can conclude that respondents with high level of neuroticism (emotional lability) react more emotionally than respondents with low level of neuroticism (emotional stability). The personality and temperament traits influence also buying decisions because it is known that more emotional consumers are more sensitive to the marketing stimuli.

We detected changes in heart rate also in probands who did not consider commercials as funny or touching. It could be the evidence that there is a difference between conscious and unconscious processes or that what people feel is not always what they say. Some marketing stimuli may work on the unconscious level. The coherent heart rhythm pattern was observed in all probands. We suppose it is because both commercials evoked positive emotions, so it could be the evidence that positive emotions smooth the heart patterns.

It was also found out that females react more emotionally than males. Many researches show that women are more emotional in every sphere of life, so we can assume that female consumers are more emotional, as well.

4. Conclusion

This paper shows how we can use the heart rate and the heart rate variability measurement on the purpose of marketing research. In this study, the emWave Desktop HRV biofeedback was used. We know that mental and emotional states directly affects the heart rhythms. During the projection of two different alcohol TV commercials we observed changes in heart rate and heart rate variability in 20 probands with similar characteristics. We could see several changes but there are a lot of factors that ought to be taken into consideration. This study is just a pilot and several improvement are necessary. Firstly we need bigger sample of respondents and we also need to know more personality differences. It is hoped that only a fraction of the utility of HRV in marketing for understanding emotional responding of consumers has far been realized, which is a truly an exciting prospect for marketers and consumer psychologists.

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Quality in rural tourism services

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Abstract
This review paper brings closer comparison of current scientific attitudes towards quality of services in rural tourism. The quality in rural tourism is a hot issue; it is applied by UNWTO and many national organizations. The review reveals trends in quality accessing, models for measuring quality and commonly used tools. The outcome of this paper should provide not only a sole description of the attitudes but also it should point on the limitations of each mentioned approach. Quality of services is with no doubts what shapes visitors view on the service itself, on the destination or products. However there exist several more or less different attitudes towards quality in rural tourism – namely on what factors are critical for overall quality of the services and visitors satisfaction.

Key words: *rural tourism, service quality, GAP analysis, SERVQUAL, IPA analysis*

JEL classification: *Z32*

1. Introduction

Tourism is developing and dynamic field. According to Simon et. al (2008) the changes in tourism are seen in the shift from simple tourist activities and services to sophisticated systems of recreation from what tourist can benefit. This is possible thanks to better economic performance, income level, standards and requirements on living as well as leisure time.

The quality of services in (rural) tourism is a frequently discussed topic, not only among entrepreneurs, visitors, and clients but among scientists and researchers as well. The scientific publications number to 137 papers/studies on this topic between 2005 and 2015. The topic quality is closely and undividable connected with satisfaction and its relation to and influence on customer/visitor loyalty has been subject to a number of researches. Tourist satisfaction has been measured and assessed by a variety of tools – namely overall satisfaction, performance, expectation, positive recommendation, etc. (Yoon and Uysal 2005). The most common used model considers satisfaction to be a difference between quality perceived and quality expected. Here some researchers (Chi and Qu 2008) point out loyalty to be a better predictor of actual behaviour compared to satisfaction. Level of satisfaction is one of the most dominant variables in explaining revisit intention in destination tourism. In today's highly competitive business environment delivering high quality service and creating superior customer value can result in achieve high customer satisfaction, thus affecting the firm's corporate image, and ultimately leading to consumer retention (Hu and al. 2009). According to Dmitrič and Žabkar (2010) perceived tourism supply quality is crucial for destination's competitive advantage. Quality of services that a visitor expects and meet in this broader point of view than stands in the beginning and is the alfa-omega of what should be considered by the service providers, destination managers and other interested people/groups at the first place.

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2. Methodology

The main objective of this paper is to provide a review of current scientific attitudes towards quality in rural tourism services. Also the paper offers closer definition of the core terms such as rural areas, rural tourism, quality, etc. The authors attempted to bring a comparative view on commonly used models and recent trends in this field, taken from general tourism and applied to the specifics of rural areas. The analysed information has been gained from published work of authors who specialize in the inter-related themes. This paper is at the same time a set resource of available scientific literature on the topic service quality in rural tourism that will be closely researched in the dissertation works of both authors.

3. Results and discussion

There follows a closer description of main topics and definitions related to rural tourism services.

3.1 Rural destination

Rural tourist destination is unclearly defined. For the purpose of drawing financial means from European funds was formulated a definition by OECD (Organisation for Economic Co-operation and Development). The definition says that rural tourist destination is the destination, where are living more than 50% habitants in rural village. The rural village is the type of village where is density of population less than 150 persons/km^2. The definition is valid for all rural destinations not only for rural tourist destinations.

Sharpley and Sharpley (1997) have made a research, which was focused on rural tourist destination. From their point of view is the rural tourist destination an area that is located away of big cities. The area is also characteristic by small villages, law density of population, economy, which is based on agriculture and traditions. Roberts and Hall have the similar view. They define rural tourist destination as a destination with low density of population, soil is used for agriculture and people follow traditions. Šíp and Vystoupil (2005) have made another definition, which says that this type of destination is a peripheral area, which form a base for cities. The destination is economically and administratively dependent on the city. The territorial system of division of labour ensures agricultural production, small services and recreation. All these definitions are constructed on the same parameters.

A different definition made Báňski (2005). He perceives rural destination as a place with low economic potential, which is a marginal part of the city or region and which is not easy to access by transport. The transport accessibility is questionable. The question is what he meant of transport accessibility. Air transport in these areas is problematic, but ground transportation has evolved in these areas, due to rural tourism. The economic potential of these areas is not high, but because of rural tourism, it is possible to improve and build infrastructure.

3.2 Rural destination

Rural tourism is seen as an environment - friendly and permanently sustainable. Rural tourism is based on the need of getting closer to nature. This type of tourism is an important economic resource for the destination. It does not entail only financial benefits, but also creates new jobs and restores and maintains the local traditions.

The scientists cannot agree on the exact definition. Getz and Page (1997) argues that the definition is important only for politicians and the public sector. To define an area is not main problem of private sector. OECD (Organisation for Economic Co-operation and Development) (2006) concurred with this approach and says that the main reason why you

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cannot find a single definition are different ideas about what is and what is not rural. Furthermore they consider the problem of a lack of relevant information about the destination and see also the fact that the definitions are made pursuant to a specific location or interests of creator of the definitions. It is not important to use an exact definition of rural tourism, but rather need to focus on the elements that are characteristic for rural tourism. To Long and Lane opinion (in Trends in outdoor recreation, leisure, and tourism, 2000) tourists want a personal contact, an authenticity of environment, historical heritage and individualism. Gopal et al. (2008) perceive as a main characteristic traits of rural tourism a personal contact, to present life at the rural destination and the opportunity to participate on activities, which people at rural destination make every day.

The general consensus is those are activities, which take place in rural destinations, such as agritourism, ecotourism and adventure tourism (OECD, 1994; Lane, 1994).

3.3 Service quality in rural tourism

The term quality is much discussed theme. The quality can be viewed from various angles. To define this term is very difficult task. It usually depends on a consumer perspective; it is often a subjective evaluation of services. A lot of definitions agree with the fact that the quality is the ability to satisfy the needs of consumers (Deming: in Quality and Reliability in Engineering (UNWTO, 2003). The quality can be seen, for example, as a sum of properties of service, which create the ability to satisfy expressed or implied needs (Kotler et al. 2007). That the organization did not depend solely on the subjective assessment of customers, have in recent years managers begun clamping on quality management systems, as it is an important instrument for achieving customer needs and business objectives. The following systems provide an objective evaluation.

One of the possibilities is the quality management standard International Organization for Standardization (ISO), which have a mark from 9000. A part of the standards are definitions, principles and requirements for quality management systems and maintaining these standards. Holders of ISO certificate in tourism, e. g. travel agencies, bus transports, use it to reflect the interest of the company for the customer.

Another possibility in quality management is using the model European Foundation for Quality Management (EFQM). This system is based on eight pillars of excellence, which include not only focus on the customer, but also put emphasis on employee, company partnerships or corporate social responsibility. In tourism is this system used for example by hotel resorts.

The necessity of quality management in tourism has developer, so called, national quality systems. Single states have developed their own standards and awards. Among the highest-quality systems include Switzerland, which is guaranteed by the Swiss Tourism Federation. This system chased „Q“ as its quality brand. The organization can receive from one to three Q. The first is awarded for the quality of services, the second Q evaluates the quality of leadership, the third Q evaluates the quality of management. Q system assesses the accommodation and destinations. Similar quality systems are in place in other European countries (Germany, Czech Republic, Austria and others).

Usually among researchers quality is seen to be an elusive and indistinct construct (Parasuraman et al., 1985). Performance quality was conceptualized as the attributes of a service which are controlled by a tourism supplier (Baker and Crompton, 2000). However quality as itself it is a problematic theme, the explanation varying among authors, often connected with contradictory results (Monroe and Krishnan, 1983; Baker and Crompton, 2000). Quality and requirements are quite hard to be exactly expressed by the consumers

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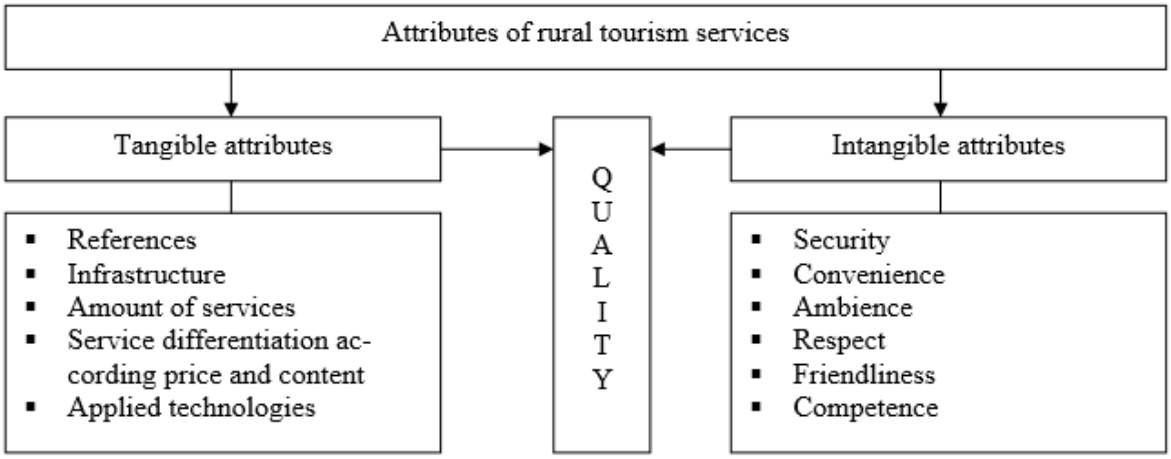
(Takeuchi & Quelch, 1983). Many researchers have proven that quality is a vital point and often a key element for entrepreneurs and companies (Parasuraman et al., 1985). Quality is highly dependable on consumers' expectations with actual service performance and service delivery process. Parasuraman, Zeithalm and Berry (1985) define the main differences of industrial services and other services.

3.4 Service quality in rural tourism

In destination management, there are commonly used several methods for assessing quality of services. One of them is a method developed by authors Alegre and Garau (2010) that composes of identification most important attributes and where tourists are asked to evaluate their relationship towards attributes on a symmetric one-dimensional scale. On the basis of above mentioned information it we are able to discover how are the tourists satisfied with different attributes of service, or what influences the overall satisfaction of tourists in the destination.

Williams (2009) argues that a basis for evaluating quality of rural tourism services are the tangible and intangible attributes of services. As per Collier (1990) rural tourism services link to attributes related to an associations covering idea, information, entertainment, knowledge, positive influence on consumers' health, social events, convenience, food, security and others.

Picture no. 1 Attributes of rural tourism



Source: Rasa Rukuižienė (2007)

Generally, there exist many different methods for measuring the visitors' satisfaction with service quality:

- Micro a macro models;
- National indexes of customer satisfaction;
- IPA (Martilla a James, 1977);
- Technical-functional model of quality (Grönroos, 1984);
- SERVQUAL (Parasuraman et al. 1985);
- REQUAL (Crompton, Mackay, Fesenmaier, 1990);
- SERVPERF (Cronin a Taylor, 1992).

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3.5 GAP model and SERVQUAL

Parasuraman, Zeithalm and Berry (1985) provide three generic views on service quality analysis:

1) Service quality depends upon consumers expectations prior to experiencing the service with service delivery system performance (advertising, previous expectations, culture),
2) Service quality is focused on specific interactions between consumer service and quality level (CS-QL),
3) Service quality is defined by the gaps, that exist between service delivered and service quality. There are distinct 5 different gaps:

i. discrepancy between consumer expectations and management perceptions of those expectations;
ii. discrepancy between management perceptions of what features constitute a target level of service quality and the task of translating these perceptions into executable specifications;
iii. discrepancy between service quality specifications and their implementation;
iv. discrepancy between actual service delivery system performance and external communications with consumers;
v. all four discrepancies lay the foundation for making the function for fifth gap with reliable measures;

The most used and accepted method for service quality assessment based on gap model is with no doubts SERVQUAL. This method works with 22 statements that are further split into 5 dimensions:

1. **tangibles** (physical facilities, equipment and appearance of personnel),
2. **reliability** (ability to perform the promised service dependably and accurately),
3. **responsiveness** (willingness to help customers and provide prompt service),
4. **assurance** (knowledge and courtesy of employees and their ability to inspire trust and confidence)
5. **empathy** (caring, individualized attention the provider offers to its customers)

(Parasuraman *et al,* 1988).

In the tourism industry Knutson (1990) developed LODGSERV – model that harnesses service quality measurement in hospitality industry. The model is based on five originally SERVQUAL dimensions. Getty and Thompson (1994) introduced another specific model for hotel environment (LOGQUAL), Ooi Mei, Dean and White (1999) created HOLSERV model. Such modifications are results of a deeper discussion about the basic 5 dimensional model and its validity (Cronin and Taylor, 1992; Thomson, 1988; Rukuziené, 2007; Baker and Crompton, 2000; Oh, 2000). Some authors emphasise a big influence of nostalgia for

natural life style, authentic experience, rural tourism in some sense can be serving as an expression of national identity (Nygard and Storstad, 1998; Ray ,1998).

3.5 IPA

IPA stands for Importance – Performance Analysis. This type of analysis was used for the first time by James Martilla in 1977. The analysis is good for tourism, but not only for it. Also for other disciplines where there is a need of knowledge about behaviour and attitudes of customers, for example education (Dawn, 2014) or health service (Carr et al, 2003). IPA reveals, which attributes is necessary to improve (Wong et al, 2011)

IPA is based on a grid with four quadrants. The horizontal line represents the performance and vertical line represents importance. According to Martilla and James (1977) are the grid quadrants defined this way:

1. quadrant: Concentrate here – attributes, which are necessary to concentrate on
2. quadrant: Keep up with the good work – these attributes are necessary to sustain
3. quadrant: Low priority – attributes, which are not important
4. quadrant: Posible overkill – attributes with performance, but which are not important for customer.

The IPA has been used in rural tourism. Barbieri (2010) has made a research in rural tourism in Canada with this method. His research was looking for an answer, which factors were important to maintain a market position and achieving goals. Fotiadis and Vassiliadis (2010) used IPA when he was looking for attributes, which encourage tourists to visit destination that he selected and whether there are differences, between perception and expectations. His expectation was confirmed. In rural tourism is a lot of sectors, which are possible to explore by IPA. Choi (2015) analysis used to measure the quality of accommodation in a rural area. Randall and Rollins (2009) have used Importance – Performance Analysis for evaluation tour guide services in the nature based areas.

4. Conclusion

This paper brought a review of commonly used models for assessing quality in services in general and their possible application in rural tourism. Such type of tourism is poorly getting accordance when the scholars define what rural tourism actually is. The paper provides views of authors that are taken as influential in the research area in question. Consequently a rural destination has been described with help of available scientific literature.
Service quality has its specifics in the rural tourism as well. The construct of quality in this term covers more than just “measurable” and “empirical” attributes. Numbers of researchers have proven that also psychological, behavioural ad cultural schemes (back-to-roots, traditions, localism, national identity, etc.) come to the “play” and influence the recognition of quality and its evaluation by the consumers in rural tourism.

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Land use optimization with respect to alternative costs of crop production choices – Case of Slovakia

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Abstract
The dominated agricultural sector in Slovakia is crop production. The major part of arable land is devoted to the cultivation of cereals (57%), followed by feed crops (20%) and industry crops (19%). There is possible to identify 4 agricultural production areas, all with different soil conditions, altitude and structure of cultivated crops. Aim of this paper is to identify the optimal land allocation within the each production area among the selected major crops cultivated in Slovakia. Furthermore it deals with modelling the production potentials with respect to policy programmes and production choices aimed on improvement of profitability in less-favoured areas. Objective is to provide land use alternative for each production area in order to maximize profit. The results suggest that the mountains areas have potentials to produce and supply feed crops, while lowlands are favourable for diverse crop production.

Key words: *production area,, inputs, total gross margins, economic optimization*

JEL classification: *C61, Q10, Q15*

1 Introduction

Changes in land use management represent the way to adapt to the future climatic conditions, including local adjustments of agricultural choices (Klein et al., 2013). Agriculture is a multifunctional activity and aims to fulfill specific functions in the society. The European model of multifunctional agriculture takes into account in addition to the primary (production) and environmental function, also the social and cultural functions related to agricultural activity (Labuda and Murtinova, 2014).

Current situation in agriculture of Slovakia is mostly affected by the process of intensification and specialization but also marginalization. Agriculture still struggles with remains of the former regime. In the period before the transformation, the intensification of production led to excessive use of fertilizers and increased requirements for livestock. The Slovak agriculture experienced complicated development after 1990, when the trade conditions have been changed and public subsidies were eliminated. The transition toward market economy after 1990 had led to change in the structure of agricultural sector causing the continuous decrease of livestock since 1993 (especially pigs). In the period between 2000 and 2011 there was a decline in the stocks of pigs by 61% (Kročková, 2013).

The dominated agricultural sector in Slovakia is crop production. The utilized agricultural land (UAL) is divided into arable land, land devoted to permanent crops, other area and permanent meadows and pastures. After the accession, the agricultural land became a part of European natural resources and therefore also the part of economic, ecological and social potential with requirements of functional soils, their protection and the accurate use. One of the priorities of multifunctional agriculture is optimal ways of using natural resources in field systems, input-output analysis and their ratios (Ministry of Agriculture and Rural Development, 2010). In Slovakia there is possible to identify 4 agricultural production areas, all with different soil conditions, altitude and structure of cultivated crops. Aim of this paper is to identify the optimal

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land allocation within the each production area among the selected major crops cultivated in Slovakia. Objective is to allocate the land among the crops in order to maximize profit.

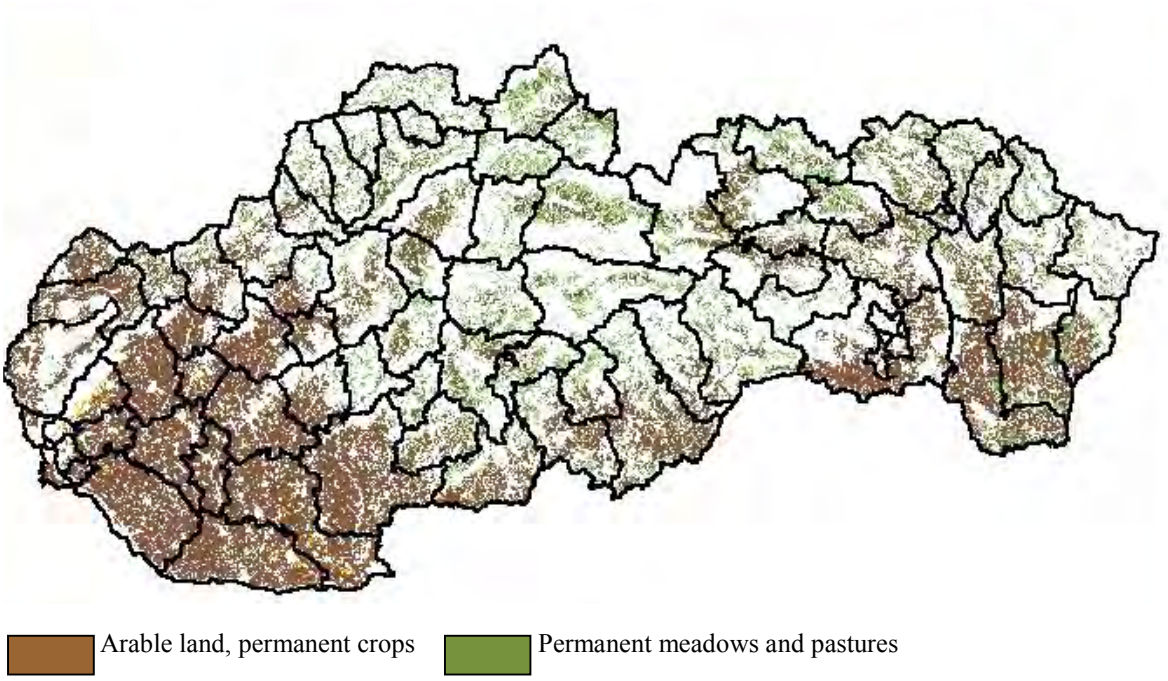
1.1 Characteristics of land use devoted to crop production in Slovakia

The utilized agricultural land (UAL) is divided into arable land, land devoted to permanent crops, other area and permanent meadows and pastures. More than 39% of total area of the Slovakia was covered by utilized agricultural area in 2014. UAL has a downward trend, which is environmentally negative phenomenon especially when it comes to set-aside areas of UAL and subsequent re-classification it into built-up areas, what is a case of Slovakia. Loss of the UAL land in recent years is approximately 1000 ha of agricultural land per year according to Soil Service. Most of the agricultural activity is allocated in the Slovakia´s lowlands. This is due to the structure of agricultural soil. The productive types of soils are concentrated in the southern, south-west and western part of Slovakia, with lower altitude. Agricultural production is therefore concentrated in regions like Bratislava, Trnava and Nitra. This can be observed from Fig.1, which represents the structure of agriculture land use. The southern part of Slovakia has also the highest concentration of chernozems and mollic fluvisoils, which are the most fertile types of soils. The majority of arable land is devoted to cereals, followed by green fodder and industrial crops

Tab. 1: The use of arable land by crop groups 2004-2014 (% of total)

Use of arable land in total (%)/Time	2004	2006	2008	2010	2012	2014
Cereals	60.19	55.05	59.1	52.73	58.49	57.85
Legume	1.11	1.35	0.81	0.99	0.61	0.45
Root crops	4.54	3.57	1.95	2.24	2.16	2.24
Industrial crops	14.86	19	18.66	20.81	16.67	18.1
Vegetables	0.88	0.7	0.55	0.96	0.65	0.52
Green fodder from arable land	17.38	18.27	17.97	19.73	19.61	19.52
Other field crops	0.07	0.11	0.09	0.02	0.13	0.41
Flowers and ornamental plants	0.01	0.02	0.01	0.02	0.02	0.01
Seeds-plantations	0.17	0.1	0.1	0.13	0	0
Fallow land	0.79	1.83	0.76	2.37	1.66	0.89

Source: Slovstat, Use of Land (2015)



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Vineyards, hop-fields, other area including domestic gardens-plot

Fig. 1: Structure of agricultural land use in Slovakia

Source: SSCRI-Soil Portal, 2015

The cereals which are cultivated the most in Slovakia are wheat, barley, rye, oats and corn. Among the oil crops rapeseed and sunflower are of greatest importance. Industrial crops typical in Slovakia are hemp, sugar beet, flax seed, hops and others.

2 Data and methods

The paper is primarily focused economic data from agricultural sector. The optimization is provided for 12 major cultivated crops in Slovakia – wheat, rye, barley, oat, maize grain, green maize, annual fodder, perennial fodder, sunflower, rapeseed, soya and sugar beet. To identify the optimal land allocation within 4 production areas among crops, with respect to inputs, we can build the optimal programming model, with objective to allocate the available land among the crops in order to maximize total gross margins (TGM). The optimization model is programmed in General Algebraic Modeling System –GAMS.

2.1 Data and their sources

The economic dataset provides the calculations of gross margins for crop rotations on regional level. Data are extracted from Research institute of Agriculture and Food Economics (RIAFE). The reference situation is based on the standard gross margins calculation considering the difference between revenues and variable costs. Descriptive statistic of calculated TGM is showed in Tab.3. The reference year modelled is 2014. The crop rotations for 12 selected, major cultivated crops in Slovakia, were derived based on the observed historical crop shares for production areas (Tab.2). There were 3 crop mixes comprising convex combinations of crops, representing agronomic cropping patterns. Alternative crop mixes represent the alternative cost of each production choice.

Tab.2: Alternative crop mixes

Production area	Crop	M1	M2	M3	Production area	Crop	M1	M2	M3
maize_PA	wheat	0.32	0.26	0.31	potato_PA	wheat	0.31	0.31	0.33
maize_PA	rye	0.00	0.01	0.01	potato_PA	rye	0.01	0.01	0.01
maize_PA	barley	0.13	0.13	0.14	potato_PA	barley	0.05	0.06	0.09
maize_PA	oat	0.00	0.00	0.00	potato_PA	oat	0.01	0.01	0.02
maize_PA	maize_grain	0.17	0.18	0.16	potato_PA	maize_grain	0.05	0.06	0.07
maize_PA	maize_green	0.06	0.07	0.06	potato_PA	maize_green	0.17	0.20	0.09
maize_PA	annual_fodder	0.01	0.00	0.01	potato_PA	annual_fodder	0.03	0.02	0.02
maize_PA	prennial_fodder	0.08	0.09	0.08	potato_PA	prennial_fodder	0.20	0.19	0.19
maize_PA	sunflower	0.10	0.10	0.11	potato_PA	sunflower	0.00	0.00	0.04
maize_PA	rapeseed	0.08	0.09	0.06	potato_PA	rapeseed	0.15	0.14	0.15
maize_PA	soya	0.02	0.03	0.03	potato_PA	soya			
maize_PA	sugar_beet	0.02	0.02	0.03	potato_PA	sugar_beet			
rape_PA	wheat	0.33	0.32	0.33	mountain_PA	wheat	0.26	0.19	0.19
rape_PA	rye	0.01	0.01	0.01	mountain_PA	rye	0.02	0.03	0.02
rape_PA	barley	0.13	0.11	0.14	mountain_PA	barley	0.11	0.12	0.10
rape_PA	oat	0.01	0.01	0.01	mountain_PA	oat	0.02	0.04	0.03
rape_PA	maize_grain	0.09	0.09	0.08	mountain_PA	maize_grain			
rape_PA	maize_green	0.09	0.10	0.10	mountain_PA	maize_green	0.10	0.14	0.14
rape_PA	annual_fodder	0.01	0.00	0.01	mountain_PA	annual_fodder	0.07	0.07	0.08
rape_PA	prennial_fodder	0.11	0.11	0.11	mountain_PA	prennial_fodder	0.35	0.32	0.32
rape_PA	sunflower	0.03	0.04	0.03	mountain_PA	sunflower			
rape_PA	rapeseed	0.14	0.14	0.12	mountain_PA	rapeseed	0.07	0.10	0.11
rape_PA	soya	0.02	0.02	0.02	mountain_PA	soya			
rape_PA	sugar_beet	0.04	0.04	0.04	mountain_PA	sugar_beet			

Source: own, based on the historical cropping patterns RIAFE

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The variable costs of crop production are the expenditures for fertilizers - purchased and produced, chemical protection, agrochemicals and seed – purchased and produced (NPPC-RIAFE, 2015). The revenues per hectare from crop production have two components – market revenues and agri-environmental payments if applicable (Stürmer et al, 2013). In the current Slovak agri-environmental program, farmers receive subsidies in form of single area payment scheme (SAPS), the "green payment" (payments for agricultural practices beneficial for climate and environment) and payment for young farmers. The producer prices and input cost for the year 2013 are obtained from Statistical office of Slovak Republic (DATAcube).

Tab. 3: Descriptive statistics of indicator TGM for crops in 2014 (4 production areas)

Crop	Mean	Std. Dev.	Min	Max
wheat	509.56	154.27	352.22	684.22
rye	235.47	47.64	185.44	290.29
barley	547.08	171.95	309.99	679.98
oat	435.71	232.97	178.62	690.15
maize_grain	739.90	121.94	621.63	865.21
maize_green	388.01	21.48	367.75	410.61
annual_fodder	644.07	113.30	497.67	739.80
prennial_fodder	744.65	72.71	682.14	845.21
sunflower	413.99	178.19	287.99	539.99
rapeseed	882.60	20.64	864.19	908.34
soya	528.00	157.41	416.70	639.31
sugar_beet	1967.04	180.14	1839.66	2094.41

Source: own calculation

2.2 Land use optimization model

The linear program for bottom-up land use optimization model is simplified version of Austrian agricultural and forestry sector model PASMA (Schmid et al., 2007) adjusted for production areas of Slovakia:

$$\max f(d, X) = \sum_i (d_i X_i) \tag{1}$$

$$\text{s.t.} \sum_i (A_{i,j} X_i) \le b_j \quad \text{for all } j$$

$$\sum_m (\theta_m M_{m,i}) \le X_i \quad \text{for all } i \tag{1.1}$$

$$\sum_i (X_i) \le \sum_m \left(\theta_m \sum_i (M_{m,i}) \right) \tag{1.2}$$

$$x_i \ge 0$$

where the equation (1) represents the objective function *f* set to maximizes TGM of optimal crop production choices. It is defined as the sum of the product of crop production choices (X) and their gross margins (d). The *i* denotes the dimensions of crop production choices production area *j*. The objective function is subject of land constrain (*b*) available for production area *j*. *A* represents the Leontief production function, the technology matrix to convert resources into

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crop products. In order to prevent overspecialization in a linear programming model, the balance equations (1.1) and (1.2) are used to include a convex set of alternative crop rotation systems based on alternative mixes of crop rotation system shares. θ stands for the choice variable for the crop rotation mix and M represents the parameter for available mixes, indexed by m. This ensures that crop rotation shares in model solutions are close to observed shares.

3 Results

3.1 Economic optimization

Considered the arable land constrained production areas, given the assumption of overspecialization prevention, the TGM is 73 485 507.46 €. Tab. 4 shows the abundance of each production area on the value of TGM. The maize production area, located in West-south plain and East plain, generates almost 50% of TGM, rape production area in West part of Slovakia, Košice hollow-basin, South-Slovakian hollow-basin, has 31% share. Potato area and mountain production area start form 500 m.a.s.l and have less favourable condition for crop production, therefore together contribute to TGM by less than 19%. The optimal cropping pattern was found to be M2 in case of maize production area, M1 in rape production area and potato production area and M3 in case of mountain production area.

Tab. 4: Land devoted to crops and share on TGM

Production area (PA)	Arable land devoted to selected crops (ha)	Share of TGM
maize_PA	50431	49.58%
rape_PA	33070	30.69%
potato_PA	14492	11.88%
mountain_PA	10676	7.86%

Source: own calculation

Maize and rape production area have the significant portion of arable land devoted to cultivation of selected crops and are suitable for diverse crop production. Potato and mountain production area have impaired condition for crop cultivation, therefore arable land is mostly covered by fodder crops.

Tab. 5 represents the optimal arable land allocation for each production area among the twelve selected crops. In order to maximize TGM in case of maize production area, 26% of arable land should be devoted to wheat, followed by grain maize (18%), barley (13%), sunflower (10%), rapeseed (9.5%), perennial fodder (9%) and green maize (7%). Other crops are cultivated in minor share.

The crop dominated in terms of TGM maximization for rape production area is again wheat with 33%, followed by rapeseed (14%), barley (12.5%), perennial fodder (11%), grain maize (9%) and green maize (9%). Rape production area has the most favourable cultivating condition for sugar beet. Other crops like rye, oat, annual fodder, sunflower and soya have only small share in terms of optimal cropping pattern.

Tab. 5: Optimal land allocation within the production areas among the selected major crops cultivated in Slovakia in 2014

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Production area	Crop	Optimal use of arable land in ha	Marginal value	Production area	Crop	Optimal use of arable land in ha	Marginal value
maize_PA	wheat	13194.95		potato_PA	wheat	4522.73	
maize_PA	rye	342.51		potato_PA	rye	204.09	
maize_PA	barley	6611.88		potato_PA	barley	766.38	
maize_PA	oat	112.03		potato_PA	oat	215.47	
maize_PA	maize_grain	9107.04		potato_PA	maize_grain	744.16	
maize_PA	maize_green	3638.05		potato_PA	maize_green	2406.86	
maize_PA	annual_fodder	232.27		potato_PA	annual_fodder	453.16	
maize_PA	prennial_fodder	4623.12		potato_PA	prennial_fodder	2936.66	
maize_PA	sunflower	5098.27		potato_PA	sunflower		
maize_PA	rapeseed	4755.50		potato_PA	rapeseed	2242.48	
maize_PA	soya	1563.37		potato_PA	soya		-908.34
maize_PA	sugar_beet	1152.02		potato_PA	sugar_beet		-908.34
rape_PA	wheat	10950.83		mountain_PA	wheat	2061.65	
rape_PA	rye	340.79		mountain_PA	rye	259.00	
rape_PA	barley	4161.98		mountain_PA	barley	1071.66	
rape_PA	oat	253.78		mountain_PA	oat	364.60	
rape_PA	maize_grain	3116.82		mountain_PA	maize_grain		-890.09
rape_PA	maize_green	2926.23		mountain_PA	maize_green	1497.93	
rape_PA	annual_fodder	344.93		mountain_PA	annual_fodder	847.44	
rape_PA	prennial_fodder	3580.87		mountain_PA	prennial_fodder	3451.60	
rape_PA	sunflower	911.53		mountain_PA	sunflower		-890.09
rape_PA	rapeseed	4532.81		mountain_PA	rapeseed	1122.11	
rape_PA	soya	542.78		mountain_PA	soya		-890.09
rape_PA	sugar_beet	1406.66		mountain_PA	sugar_beet		-890.09

Source: own calculation

In the potato production area the arable land is dominated by wheat (31%), perennial fodder (20%), green maize (17%), rapeseed (15%). In order to stay at maximum level of TGM, the other crops comprise only minor part of arable land. Sunflower, soya and sugar beet are not cultivated in this area. The marginal value means that the cultivation of soya or sugar beet would decrease profit by 908.34 € per ha of additional crop in this area.

Mountain production area is identified as “less-favoured” area, because of higher altitude and less productive types of soils. It also has minimum land occupied by arable land. The TGM in respective area is maximized by major involvement of perennial fodder which should be cultivated on 32% of arable land followed by wheat (19%), green maize (14%), rapeseed (11%), barley (10%), annual fodder (8%), oat (4%) and rye (2%). Other crops are not suitable for this production area. As suggests the marginal value from Tab. 5, cultivation of grain maize, sunflower, soya or sugar beet would decrease profit by 890.1 € per ha of additional crop in this area.

As for the TGM per individual crop production choices in each production area, the highest TGM is in maize and rape production areas. In terms of variable costs, maize production area has the highest costs and are approximately 1/3 higher compare to the rape production area (Tab.6). On the other hand potato and mountain production area have lower levels of TGM. Shadow prices in Tab.6 represent how much land must be added to respective production area in order to generate one euro of gross margin. In maize production area it would require 722.4 ha, in rape production area almost 682 ha, 602 ha in potato production area and 541 ha in mountain production area.

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Tab. 6: Resulting values of TGM and inputs

PA/indicator	TGM	Seed_E	Seed_P	Fer_E	Fer_P	CHEM	AGROCHEM	OH_P	ShadowP
maize_PA	36432039.7	4372777.4	489876.0	6863103.0	1772344.8	5873080.9	1782783.2	4150405.1	722.4
rape_PA	22549447.4	2539356.3	273300.5	4280302.7	1288441.0	3861481.7	1384118.9	3245582.5	681.9
potato_PA	8726891.0	1025896.4	115299.9	1546204.6	330260.6	1599731.7	414505.4	1061601.8	602.2
mountain_PA	5777129.5	562980.6	107284.9	817742.2	403081.0	567014.4	189032.8	660049.8	541.1

Notes: TGM – total gross margins, Seed_E – purchased seed, Seed_P – produced seed, Fer_E – purchased fertilizers, Fer_P – produced fertilizers, CHEM – chemical protection, AGROCHEM – agrochemical services, OH_P – production overheads, ShadowP – shadow price
Source: own calculation

3.2 Production potentials with respect to policy programmes in less-favoured areas

Less- favoured areas –potato and mountain production area- are agricultural areas in which the influence of unfavourable conditions, altitude, slope-and low soil fertility and other adverse natural conditions or in connection with specific local economic and social conditions, the costs per unit of production in agricultural activity are permanently higher than average.

Based on previously calculated economic optimization of arable land use allocation based on inputs utilization, the potato production area is suitable for cultivation of wheat, perennial fodder, green maize and rapeseed. Mountain production area has production potential for perennial fodder and in lower share for wheat, green maize and rapeseed. This area was identified to have the most favourable economic condition for oat cultivation, compared the other production areas.

The policy experiment is conducted in order to increase the profitability of less-favoured areas. In both areas we model the doubling of subsidies for crops which have the most favourable production potentials. In case of potato production area it is perennial fodder and green maize. In mountain production area it is perennial fodder, green maize and oat.

Tab. 7: Resulting values of TGM under the new policy scheme

PA/indicator	TGM	Subsidy increase(index)	TGM_subsidy_scenario
maize_PA	36432039.7	0	36432039.7
rape_PA	22549447.4	0	22549447.4
potato_PA	8726891.0	1	12867435.1
mountain_PA	5777129.5	1	9126180.0

Source: own calculation

The results (Tab.7) suggest that under the doubled subsidy scenario, the TGM in potato production area would increase by 4140544.1 € and in mountain production area it would lead to increase by 3349050.5 €.

4 Conclusion

Maximum TGM for all production areas with respect to optimal arable land allocation was 73.5 mil. €. The highest share on this result can be attributed to lowlands due to their high production potentials. Potato area and mountain production area start form 500 m.a.s.l and have less favourable condition for crop production, therefore achieved lower values of TGM. Structure of the cropping pattern was diverse in maize and rape production area and involved all 12 crops. In both areas the dominated crop was wheat and grain maize. In terms of variable costs, maize production area had the highest costs and were approximately 1/3 higher compare to the rape production area. In terms of economic optimization, potato and mountain

production areas are suitable for fodder and other feed crops cultivation. Soya, sugar beet, sunflower and also the grain maize in case of mountain production area, are not cultivated in less-favourable areas. In mountain production area there is potential for rapeseed and oat production, which are the crops for feeding and industrial purposes. In maize production area to increase TGM by 1€ would require 722.4 ha increase in arable land, in rape production area almost 682 ha, 602 ha in potato production area and 541 ha in mountain production area.

In order to increase profitability in less-favoured areas, there was a subsidy increased policy scenario applied. The doubled subsidy scenario resulted in increase by 4 mil. € in TGM in potato production area and in mountain production area it led to increase by 3.3 mil. €. The doubled subsidy scenario was applied on perennial fodder and green maize in both production areas and on oat in case of mountain production area. These production areas have the economic potential for cultivation of feeding crops with respect to variable inputs.

In terms of production potential it is desirable to synchronize production and economic optimization to identify the environmental aspects of crop production. Lowlands might be the obvious choice from economic perspective, but exploitation of soils lead to high environmental pressures. On the other hand in less-productive areas there could be possible to identify the significant stocks of marginal land for cultivation of 2. generation biofuels feedstock.

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Implementation, development and evaluation of quality management system in selected companies

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Abstract
In the increasingly competitive market it is necessary to continually find ways to improve their own competitiveness. One of the crucial factors of competitiveness is the quality of the manufactured products and services. Quality as the compliance with the requirements of the customers should therefore be the focus of each company because it crucially affects customer satisfaction, loyalty, and the end result is the prosperity of a company. Quality management as a summary of approaches to quality management has undergone many years of development from a simple inspection of the product through quality control of the product, later through quality assurance already committed to preventing defects to complex quality management that fundamentally changing the way the companies in all areas are being managed. Customer demands for quality are reflected in the prices of individual products or services. Each producer must ensure its products having not only the appropriate level of quality but the quality must be also continually assured and demonstrated in the long run. It is important to note that the quality management system nowadays is not a luxury matter but a necessity and it must be said that the introduction of such a system does not automatically improve the company. It is a long process that would ultimately lead to improving customer satisfaction and stakeholder efficiency, to lowering costs, reduced risk, increased productivity, clear identification of responsibilities and of course last but not least to the improvement of the product quality itself. Each company will certainly benefit if the quality management system is certified by a third party certification authority. The best is if this authority is an organization also accepted abroad. A very important factor is also the attitude of the company's leadership towards how the quality management system is used to benefit the organization and whether the principles of the system are regularly used in the practice.

Key words: *ISO, management, quality, quality management, quality management system, TQM*

JEL Classification: *M000, M110, M190*

1. Introduction

At present, each producer who wants to be successful in the competition on demanding markets of developed industrial countries or on less demanding local markets must ensure its products having not only the appropriate level of quality, but the quality must be also continually assured and demonstrated in the long run. Therefore, the term quality as well as compliance with customer requirements should be in the focus of each company as it has the crucial effect on the satisfaction of customers, their loyalty, and the prosperity of the company is the final result. We have to understand that quality management nowadays is a necessity but at the same time it must be stressed that the introduction of such a system does not automatically represent an improvement of the company. It is a long-term process that should lead to improvement of satisfaction of customers and other stakeholders, efficiency, cost and risk reduction, increasing labour productivity, a clear identification of responsibilities, and last but not least the improvement of quality of the product itself. It is an advantage for companies to have a quality management system certified by a certification authority. Most ideally, this authority should be a company accepted internationally. A daily fight with problems of companies should be replaced by prevention and the long-term planning and improvement of processes within the

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organization. The permanent quality of products or services can be achieved only by a systematic prevention of shortcomings and focus on an exact production process and compliance with internal quality guidelines and working methods. For an organization to be successfully managed and operating, it has to be managed and led in a transparent way. The implementation of such a system is not simple; the company culture plays an important part in it. It is therefore necessary to create favourable conditions, motivate people adequately, and establish a creative atmosphere, support team work and communication.

The currently valid usage "achieve the highest possible quality" has been interpreted by some companies in their own way. They don't focus on the achievement of the highest quality, but on the achievement of quality on the level required by customers. On the other hand, in the common segment, the customers, however, don't want to accept any compromises in terms of quality, but they require lower prices. It is a big challenge for companies to cope with these current trends on the market. **Marinič (2008)** has added that a satisfied customer is a synonym of a loyal customer, and his satisfaction originates from the overall value of the product or service that is influenced, besides the product or service image, customers' expectations and the perceived quality, also by the quality of products in question. **Mateides (2006)** has defined the quality management as coordinated activities aimed at guiding and managing the organization with regards to quality, and he has based this definition on the norm STN EN ISO 9000:2005, on the part related to the quality management systems and the section Fundamentals and Vocabulary. He understands the quality management system as the structure of the organization, the methods, processes and resources necessary for the implementation of the quality management. Three concepts of quality management have been established in the evolutionary development: the conception of company or branch norms, the ISO conception and the TQM conception. An important instrument for the quality improvement and the central instrument for the quality management assessment is the internal audit. **Beránek – Kotek (2003)** have stated general and main steps during the certification of the entire organization or the certification only of its part. The certification can be preceded by a preliminary voluntary audit in that the auditors of the certification authority assess the quality management system.

2. Data and methodology

The goal of the presented research is to evaluate the implementation, development, assessment and contributions of the quality management system in Slovak food processing companies and to submit an overview of quality management systems applied in Slovak companies.

In this research, primary data have been used taken from the own research, and the secondary data have been taken from the documents of the State Veterinary and Food Administration (Štátna veterinárna a potravinová správa), the reports of corresponding Ministries, the ISO documents, the Annual Reports of the Office for Normalization, Metrology and Examination of the Slovak Republic (ÚNMS SR), the Annual Reports on the situation of agriculture and food industry in the Slovak Republic, and the internal material of companies. The goal has been achieved through a questionnaire survey with the aim to get familiar with the level and the situation of application and implementation, development and assessment methods in relation to the quality management systems in selected companies in the Slovak Republic. The basic research method was the questionnaire. The criterion for the establishment of the research sample was companies operating in the Slovak Republic. The questionnaire had 2 parts: The Part A consisted of 7 questions and contains the information about the questionnaire respondents. The 7 questions focus on the definition and identification of the legal status of the company, the industry branch in which the companies operate, the company type, the company size according to the categories by the European Commission as of January 1, 2005, the duration of their economic activity, the number of employees, the character of management (local or

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international), owners etc. The Part B consisted of 14 questions, 11 of them were with closed answers and 3 questions were with open-ended alternative answers. The data gathered by the questionnaires and the research have been structured in overviews (in form of tables and charts) for further processing, the consequent analysis, assessment and evaluation. During the analysis of relations and interdependencies between the qualitative factors, the association and contingency analysis has been used. The existence of interdependence between the factors has been verified by a Chi-squared test. We have also used the following methods: Index Analysis, SWOT, Pareto analysis, Brainstorming and Benchmarking.

3. Results and discussion

The current situation of quality management in the world

The number of ISO 9001 worldwide certifications achieved 1,138,155 in 2014. The following table proves this; we have added a chart for a better clarity. It follows from the table that the ISO 14001 is popular, too, whereas the ISO 22 000 and ISO 16 949 certifications have been required less and in incomparably lower numbers than ISO 9001 and ISO 14 001. It is connected with the fact that the ISO 22 000 as quality and food safety management is a specific norm, the same applies to the norm that is used exclusively in the automotive industry and in the automotive supplier industry. The relatively new ISO 22 000 norm has registered the fastest growth, beginning from a different (lower) starting basis.

Table 1: Overview of overall numbers and the worldwide growth of issued certifications according to ISO 9001, ISO 14 001, ISO 22 000 and ISO 16 949 in the period 2005-2014

	Overview										
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	*05/14
ISO 9001	773 843	896 905	951 486	980 322	1 063 751	1 118 510	1 079 228	1 096 987	1 126 460	1 138 155	147,08
ISO 14001	111 163	128 211	154 572	188 574	222 974	251 548	261 926	284 654	301 622	324 148	291,60
ISO 22000	na	na	4 122	8 185	13 838	18 580	19 351	23 278	26 847	30 500	*739,93
ISO 16949	17 047	27 999	35 198	39 320	41 240	43 946	47 512	50 071	53 723	57 950	339,94

*Index 2007/2014

Source: http://www.iso.org/iso/iso-survey and the own compilation

Figure/Chart 1: Overview of the worldwide growth of ISO certifications

Source: http://www.iso.org/iso/iso-survey

Figure/Chart 2: Overview of the ISO 9001 certification share worldwide in 2014

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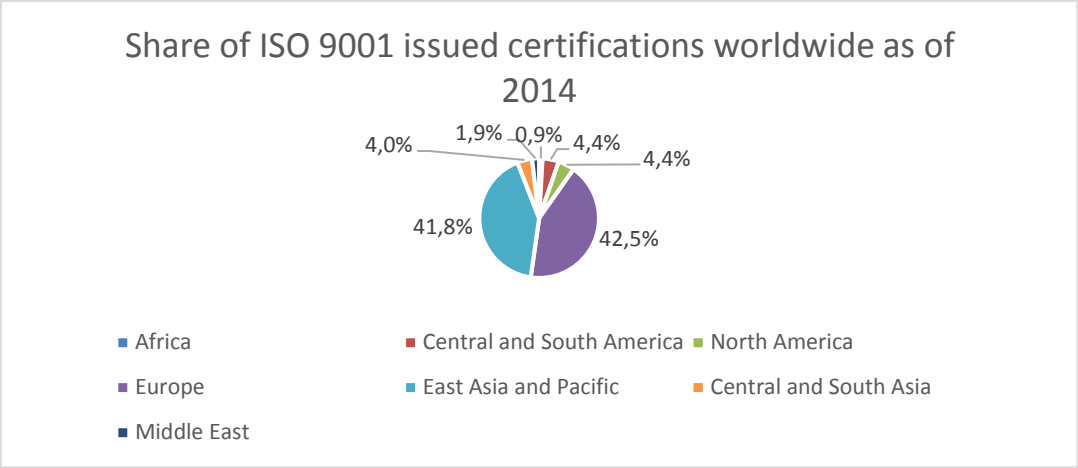


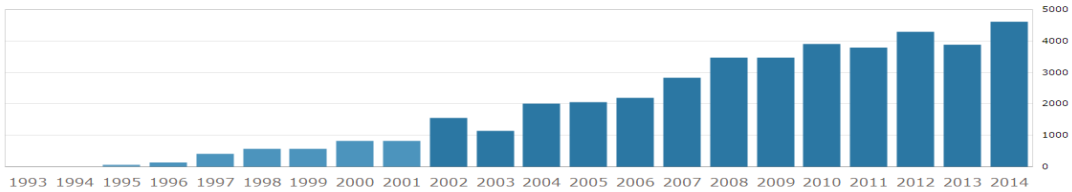
Source: http://www.iso.org/iso/iso-survey and own compilation

When comparing the number of ISO 9001 issued certifications and their worldwide distribution by 2014, we can see that the highest demand was in Europe (42.5%), followed closely by East Asia and Pacific (41.8%). Other world regions have rather an insignificant position in terms of demand for ISO 9001 certifications representing max. 10 % of the worldwide demand. In terms of the regional distribution of ISO 14 001 issued certifications and the demand for them before 2014, the highest share of interested customers are companies from East Asia and Pacific (51.3%), followed by European companies (38.2%). ISO 22 000 is in a similar position with a share of 46.7%, whereas 34.9 % is in favour of East Asia and Pacific and Europe. Almost 8 % are companies from Central and South Asia, the rest is a negligible amount. ISO 16 949, the norm used in the automotive industry and its suppliers was so far the most demanded norm in East Asia and Pacific (with a share of 56.5 %), Europe (20.4 %), North America (10.2%) and in Central and South Asia (8 %). This relates to the seat of main world automotive companies and their suppliers. All these facts are clearly demonstrated by the following figures. The most ISO 9001 certifications by 2014 were issued in Italy (229,928) and in France (113,349). In terms of the industries, the most certifications (118,652) were issued in the area of metal and metallic products processing, followed closely by the area of electric and optic components production (86,728 certifications). As far as the ISO 14 001 norm is concerned, the most certifications by 2014 were issued in Italy (178,137), in France (39,336). The most ISO 14 001 certifications were issued for building and construction companies as well as for companies in the area of metal and metallic products processing.

The current situation in the quality management in Slovakia

The following figure shows the development of ISO 9001 certifications in Slovakia in the period 1993-2014. It proves the growing trend and the growing interest in individual quality managements systems.

Figure/Chart 3: Development of ISO 9001 certifications in Slovakia



Source: http://www.iso.org/iso/iso-survey

Differences between ISO and TQM

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The ISO is a management system created for monitoring of functions and data in a specific organization and operating on monitoring basis. The TQM is a management system, too. It works on the basis of regular participation of employees, and it provides the correct management of instruments and technologies in individual departments. The ISO is a system ensuring the international standards requirements in terms of quality. The TQM are activities to achieve the corporate quality and culture with the aim to top the competitors by satisfying customer needs effectively and efficiently. The ISO standards deal with an effective documentation of methods how a company is managed in order to improve the profit margin. The TQM deals with customer satisfaction and employee efficiency in order to improve business and reduce costs. A company should first implement the ISO standards, and then implement TQM to improve the profitability and the loyalty of customers. The biggest difference between the TQM and ISO is the one is a method and a designation of an international organization. That means that a third party inspection analyzed the company policy and processes and found out that they comply with the ISO standards that are applied in the company. But what is their difference in terms of the output? The ISO describes functions and actions that must be implemented, so that the company has the minimum quality standards. The ISO can be regarded as an instrument for TQM implementation and has also some basic requirements, such as a strict documentation for audits. With the help of such management programmes, it is easy to monitor documentations in terms of quality. The TQM focuses on the identification of the best and maximum results and methods and how to achieve them. It can be perceived as a management system based on quality. The TQM does not require any kind of documentation. The research about the TQM implementation has shown a high level of employee and product improvement. The ISO systems were not able to achieve the same quality standards without a support by TQM. Both systems should complement each other. In the long-term perspective, there is no difference between the two in terms of the output if both programmes work to improve the company functions. The usage therefore shows that both programmes can work better if they are implemented separately or for different purposes and goals in order to achieve the best results. It can be added that the ISO is rather a programme helping with the management processes. The TQM is not only a programme, although it helps to get to the core of the quality improvement process. The ISO requires a more sophisticated analysis. The TQM helps with the needs of the management in a more practical way.

As individual managements systems are not rigid but are being constantly developed to fulfil the requirements of the present world and the market environment, revisions of individual norms are implemented in regular intervals. So, e.g. we know a number of editions of the ISO 9001, specifically from 1987, 1994, 2000, 2008. The most up-to-date version is from 2015. In the recent years, the ISO 9001 for the certification of quality management systems and ISO 14001 for the environmental management systems certification were subject to analysis, whereby the International Accreditation Forum (IAF) and ISO published new norms in the versions ISO 9001:2015 and 14001:2015 on 15 September 2015 i.e. edition from 2015, that replace the ISO 9001:2008 and ISO 14001:2004. In accordance with the resolution adopted on the 27th IAF General Assembly, a transitional period of three years was established for the implementation of ISO 9001:2015. At the same time, the 28th IAF General Assembly determined a transitional period of three years for the implementation of ISO 14001:2015. The IAF General Assembly, at the same time, determined the policies for the operation of certification bodies and certificated organizations of customers during the transition to new standards (IAF Document IAF ID 9:2015 for ISO 9001 and IAF Document ID 10:2015 for ISO 14001). The General Assembly determined with these resolutions the three-year transitional period for the implementation of new standard versions that ends on 15 September 2018. Our most known certification authority TÜV SÜD Slovakia s.r.o. issued a declaration in this connection that “it will certify the quality and environmental management systems in the

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transitional period according to both standard versions, i.e. ISO 9001:2015 as well as ISO 9001:2008; and ISO 14001:2015 as well as ISO 14001:2004. The certifications issued according to the original standards ISO 9001:2008 and ISO 14001:2004 will be valid only until 14 September 2018."

Changes in terms of the recent revisions of standards in 2015

The ISO 9001 and 14001, their revisions from 2015, were issued on 15 September 2015 and their impacts, changes and consequences are subject to intensive analyses among experts. The last large revision, for example of ISO 9001, was carried out in 2008, i.e. after 7 years, and the issue of new standards is an important milestone in the quality management systems. The results of analyses are subject to internal know-how of certification companies, and, as it has been already mentioned above, these systems are complex systems, and there is a 3-year transitional period for the implementation of new standards. But on the Internet, first results of analyses can be found, and it is possible to sum up the differences between the new and the old revisions of standards. It is known nowadays that the new 10-chapter structure is the fundamental change. The aim of this change is to unify formally the structure of the content of all quality management standards that have been issued and are being issued, such as ISO 9001, ISO 14001, OHSAS 18001 (in the new version of ISO 45001), ISO 27001 etc. and to ensure their easier and simpler implementation.

ISO 9001:2015

The standard uses in the entire wording the following verbs for the requirements:

- "shall" as requirements,
- "should" as recommendations,
- "may" as permissions,
- "can" as possibilities or capacities.

Besides this change, the ISO 9001:2015 will bring, in comparison to the revision from 2008:

- a higher flexibility of requirements, a more general and simple character of the application of requirements for companies and organizations providing services,
- a more explicit emphasis on the process approach and PDCA methodology,
- risk and opportunities managements in all processes included in the quality management system,
- a better orientation for a performance increase of companies and organizations,
- new definition of leadership for the top management and its better involvement into the quality management system,
- requirements for active search of opportunities for the improvement of the quality management system.

In the structure of the new standard, the new revision of ISO 9001:2015 will bring, in comparison to the revision from 2008, the following:

Chapter 0. Introduction

- emphasis on the strategic decision to adopt the quality management system,
- emphasis on the process approach and its application within the requirements of the norm – the norm includes a graphic presentation of the process and its elements,
- a new chapter focusing on the application of the PDCA methodology in processes – the norm includes a graphic structure of chapters (processes) of the norm according to the PDCA principle,
- a new chapter describing the principles of thinking based on risks that is applied in the entire norm,

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- quality management principles are stated already in the introduction of the norm.

Chapter 1. Scope

- The purpose of the norm remains, but the Article 1.2 Application and the term "exception" related to it were deleted.
- The term "product and service" is interpreted in the norm only as a "product and service" defined or required by the customer.

Chapter 2. Normative references

- The norm states the reference to ISO 9000:2015 Quality Management Systems – Fundamentals and Vocabulary (this norm is also revised and was issued together with ISO 9001:2015 in September 2015).

Chapter 3. Terms and definitions

- The norm states a reference to ISO 9000:2015 Quality management systems – Fundamentals and Vocabulary.
- The term "product" was replaced by the term "product and services".
- New terms and definitions were added:
  - risk,
  - top management,
  - documented information,
  - outsource,
  - context of the organization,
  - function, strategy
  - knowledge, innovation,, data, informationt etc..
- Some definitions for original terms were specified and updated.

Chapter 4. Context of the organization

- New requirements for identification and monitoring of internal and external impacts that are important for purposes and the strategic direction of the company.
- New requirements for the determination of stakeholders and their requirements that are important for the quality management system.
- The scope and limits of the quality management systems will have to be determined as documented information.
- It is not explicitly required to prepare a quality guide.
- New requirements for processes were added, such as determination of inputs and outputs, competencies, performance indicators, risks and opportunities.

Chapter 5. Leadership

- A higher extent of competencies and involvement of the top management will be required.
- The task of the top management is extended and includes leadership as well, not only management.
- A new requirement for the integration of requirements of the quality management system into "business processes".
- The requirement for the nomination of the management representative was not stated.
- A new requirement for the determination of risks in relation to the customer.

Chapter 6. Planning

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- A new basic requirement for the determination of risks, opportunities and measures how to solve them.
- Risk and opportunities management and the measures how to solve them are replaced by the preventive activities.
- A new requirement for planning to achieve quality objectives.
- Changes of the quality management systems will have to be planned.

Chapter 7. Support

- This chapter includes the management of people, infrastructure, and environment for the process operation monitoring and measuring resources, organizational knowledge, competencies, awareness, communication and documented information.
- The management of documents and records is, in the new way, defined as "documented information" – there is no requirement to process 6 documentation procedures.
- New requirements on the management of organizational knowledge.
- Monitoring and measuring resources replace the monitoring and measuring devices.

Chapter 8. Operation

- Operation planning and management focuses on the planning, implementation and management of processes and measures against risks.
- The communication with the customer is preferred to the definition and analysis of his requirements.
- A new requirement for the determination, implementation and maintenance of design and development processes.
- Purchasing has been changed to "management of externally provided processes, products and services".
- A new requirement for determination of performance indicators of external providers.
- A new chapter and requirements for the release of products and services.
- In the entire chapter, the emphasis is on the application of process management, risk management and measures.

Chapter 9. Performance evaluation

- A new requirement for the performance and efficiency evaluation of the quality management system.
- A new requirement for the efficiency evaluation of measures against risks.
- A new requirement for performance evaluation of external providers.
- Each internal audit will have to have defined independent criteria and scope.
- This chapter includes also the "analysis by the management" – inputs in the analysis were added.
- Evaluated indicators will have to be added with their development trends.

Chapter 10. Improvement

- The article "Preventive measure" was eliminated – replaced by the risk and opportunities management.
- A new requirement for active determination of opportunities for improvement.
- New requirements connected to the analysis of reasons for discrepancies.

4. Conclusion

The resources of every company are limited, that's why it is necessary to start the necessary improvement from the biggest shortcomings, and areas where we can achieve the biggest, the most relevant and most visible improvements. The research result was the finding that the ISO 9001:2008 is one of the most frequently applied international quality management norm, whereby the number of ISO 9001 worldwide certifications in 2014 reached the number of 1,138,155 in 178 countries all over the world. As we could find out in the research, the largest demand for ISO 9001 certifications is in Europe (42.5%), followed closely by East Asia and Pacific (41.8%). In relation to ISO 9001, the largest demand for certifications was in Europe, the next very popular norm, ISO 14 001, had the largest share of interested parties from East Asia and Pacific (51.3%), followed by European companies (38.2%). The situation is similar in connection with ISO 22 000, its share is 46.7% in favour of East Asia and 34.9% in favour of Pacific and Europe. Almost 8% are companies from Central and Southern Asia, the rest is a negligible share. The norm used in the automotive industry and its suppliers, ISO 16 949, has been so far demanded mostly in East Asia and Pacific. The highest number of ISO 9001 certifications by 2014 was issued in Italy (229,928) and in France (113,349). In terms of industries, most certifications, i.e. 118,652, were issued for metal and metallic products processing, followed closely by the electric and optic components production (86,728 certifications). The same demand for certifications was noticed in relation to the ISO 14 001, the highest number of certifications by 2014 was issued in Italy (178,137) and in France (39,336). Most ISO 14 001 certifications were issued for companies in the building and construction industry (43,999) as well as for companies in the area of metal and metallic products processing.

Our research has shown that the interest for certifications has been growing every year, and the companies have been aware of the need and benefits of certification for them. That is why the revisions of ISO 9001 and 14001 from 2015 have been recently the most observed revision. These revisions were issued on 15 September 2015 and their impacts, individual changes and consequences are subject to intensive analyses among experts as this revision has come (in case of ISO 9001) after 7 years and in case of ISO 14001 after 10 years.

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Environmental good practice to life by the help of renewable energy through the example of some settlements

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Abstract
The environmentally conscious lifestyle is widespread overall in the world but not very common in Hungary yet. We all want to live in an environmentally friendly way to the future generations, which will only succeed if we start the environmentally conscious life-time education now and for future generations. We have to take steps not only personally but overall also to help to realise why so important to form this environmental development. One way to use renewable forms lies that has even a rudimentary degree of utilization in many countries, including large parts of Hungary as well. Many people feel that they can do is out of proportion to what it can achieve, and this incorrect thinking the main obstacle in the spread of environmentally conscious approach.
The aim of my research was that through the example of some settlements of Heves county renewable energy as environmentally conscious life education opportunities in the instruments of investigation.
In my primary research I wanted to examine some settlements in Heves County how familiar are the people to the knowledge of renewable energy and how this can help as a tool for environmental education for life.

Keywords: *environmentally conscious lifestyle, environment-friendly, renewable energy, settlements*

JEL Classification: *O13, P28, Q42, R11*

1. Introduction

For most of the people being environmentally friendly means having a lifestyle that are better for the environment. This means we have to define ourselves and have to take small steps towards the Earth so we can make this planet a better place for our communities and generations in the future (Being environmentally friendly, 2016).

The basic question is how the renewable energy as a means of education to environmental good practice to life can help us by the help of some settlements as example in Heves county.

If we want to find the answer to this question we can think of the following options which would be good choices to start with: Pay off in the long run to consume less energy for example in the household like installing LED lights or use effectively the natural skylights. Other ways can be the water conservation, become less reliant on cars and rather walking more, eating locally grown vegetables, buying recycled products (for example paper bags, paper cup, synthetic material, etc.) or use fewer chemicals (Begley, 2008). Even we can join environmental groups to combat different kinds of air pollution like carbon dioxide or the greenhouse gas which are the main pollutants that are warming the Earth (Wengenmayr – Buhrke, 2012).

In this study my aim was to investigate how the population will be able to live being environmentally friendly through the example of some settlements of Heves County by the help of the renewable energy.

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Figure 1: The location of Heves County on the map

Source: Own work on the basis of http://www.google.hu/maps/place/Heves/, 2016

1.1 The importance of become environmentally friendly

In the aspects of the future it is the interest of all to become environmentally friendly. The renewable energy can be a good way to help in this lifestyle. At the moment we can use the following renewable energies:

- *Solar energy:* Inexhaustible and cheaper than the other kinds of renewable energies. The solar energy now powers everything from portable radios to homes, stores and neighborhoods. My own researches prove that in Heves County this is very common in towns and villages by usage. Great examples are Visonta, Abasár, Gyöngyös, Eger or Egerszalók (Sembery – Tóth, 2004).
- *Wind energy:* Wind energy costs about the same as electricity from new coal- and gas-fired power plants, and also it's pollution-free. It is rarely used not only in Heves County but overall in Hungary yet. The main reason can be that the circumstances are not good enough to use this kind of energy effectively.
- *Biomass energy, cellulosic ethanol:* Biomass is organic matter derived from living, or recently living organisms. Biomass can be used as a source of energy and it most often refers to plants or plant-based materials. Plant materials, such as wood, corn, and soy also included but in Heves County it is still not typical (Kovács, 2010).
- *Biogas energy:* Biogas typically refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen. Biogas can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. In case of Heves County there are some

municipalities like Hatvan, Kisnána, Markaz, Karácsond, Recsk, Gyöngyös, Gyöngyöspata and Gyöngyöstarján which are using biogas energy (Source: own research, 2016).

- *Geothermal energy:* Reservoirs of steam and hot water beneath the earth's surface hold enormous potential as a renewable energy resource. Hungary geothermal energy assets in the subsurface rocks formed during the geological eras provide heat content. Our country belongs to the group of countries with favorable geothermic. It has better rate than the world's average level in geothermal gradient, high water-bearing rock mass is present in large quantities at one time. In case of Hungary could be good opportunities to use this renewable energy but it still does not have the right technology and the financial resources. Efforts are already planned for the future usage from 2016 to 2020 thanks to the tenders of European Union (European Union 2020 renewable energy targets, 2016).
- *Hydropower:* Derived from the energy of falling water or fast running water, which may be harnessed for useful purposes. While water is a renewable resource, rivers themselves are not. Hungary technically usable hydropower potential of approx. 1000 MW, which goes beyond the production of electricity actually recycled or recovered hydropower potentials. The percentage distribution roughly as follows: Duna 72%, Tisza 10%, Dráva 9%, Rába-Hernád 5%, Other 4% (Source: Vízenergia hasznosítás Magyarországon, 2016).
- *Off shore wind, wave and tidal energy:* Offshore renewable energy holds great promise, and can be developed in a way that protects our ocean resources. Since Hungary does not have any sea we can not use the benefits of this kind of energy.

2. Data and Methods

The aim of my primary research was to gather as much information and opinion about the main topic which is how we can become environmentally friendly by the help of the renewable energy. I examined some municipalities in Heves County where we can find this kind of efforts.

I used standard questionnaires as a method. A standardized questionnaire guarantees that the same monitoring process applied to each respondent. It is a very effective but simple way to gather primary research. As a first step it was important to ask from the respondents whether they know the meaning of renewable energy. Based on the opinion of respondents I also wanted to know which renewable energy can help the most to develop the environmentally conscious lifestyle.

3. Results and Discussion

To know more about the environmentally friendly lifestyle it was necessary to ask in the questionnaire whether the population of the major towns in Heves County know what the renewable energy really is. I prepared the survey in four major towns in Heves County which are Eger, Gyöngyös, Hatvan and Heves.

From every town 60 person filled the survey (total 240), in this way I was able to separate the answers by 3 different types: 1. They mostly know the meaning of renewable energy (Yes, I know). 2. They only know just a few things about renewable energy sources (Just a few). 3.

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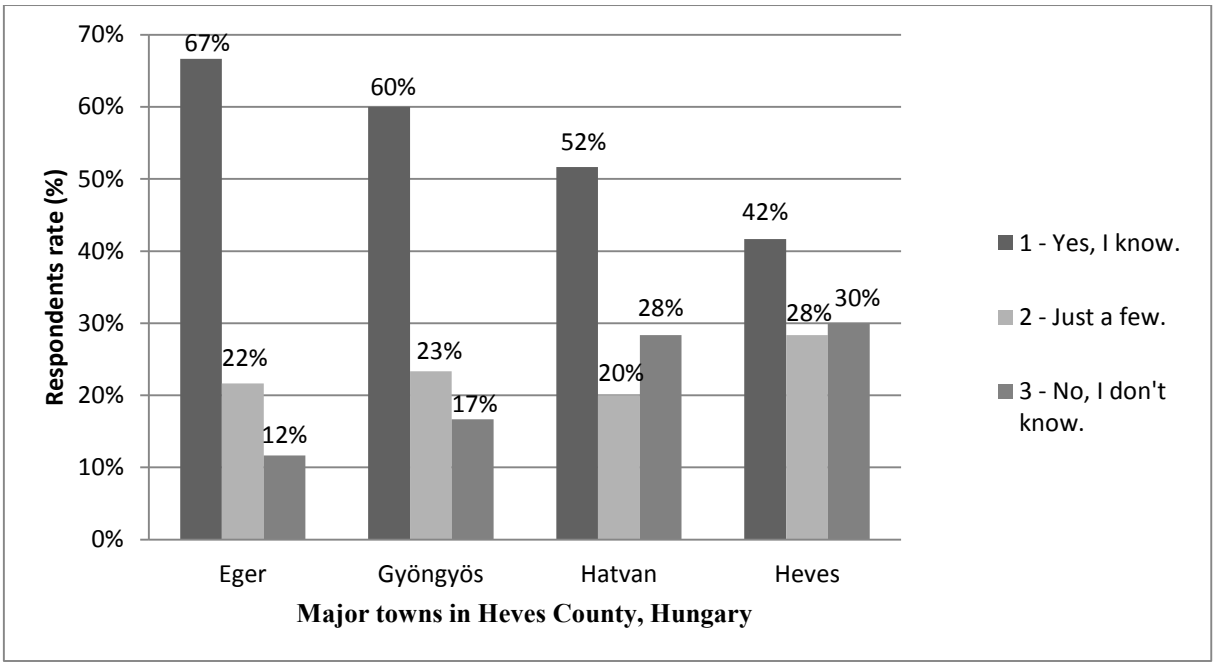
They do not know much or do not know anything at all about renewable energy (No, I don't know).

Figure 2: The percentage of respondents regarding the knowledge and definition of renewable energy (2016)



Source: Own research and compilation on the basis of primary questionnaire, 2016

Based on Figure 2 we can see that Eger has the highest respondents rate on answer one, which means 67% of the respondents mostly know what is the definition of renewable energy. Compared to Hatvan or Heves it has a high knowledge rate. From the 60 respondents each town only 22% of them know just a few things about it and 12% of them do not know anything about the meaning of renewable energy. In case of Gyöngyös the knowledge about the definiton of renewable energy also high, exactly 60% which is also a high rate.

The 23% of the respondents said they not really know the definiton of renewable energy and 17% of them do not know anything at all about the meaning. Hatvan has different values because slightly more than half (52%) answered they know the meaning of renewable energy. Only 20% of them said they know something about it and 28% of them answered they do not really know what is the meaning of renewable energy.

Based on Figure 2 we can say in Hatvan and Heves should make more efforts because in the next few years the importance of renewable energy will increase greatly and they will be at disadvantage in development projects. The fourth is Heves where based on the answers of respondents 42% of them have knowledge about renewable energy and 28% know just a few things about its definition.

I also wished to know whether the respondents of my questionnaire live environmentally responsible and have the right behaviour to fulfill this intention. The question was: "Do you live environmentally responsible?"

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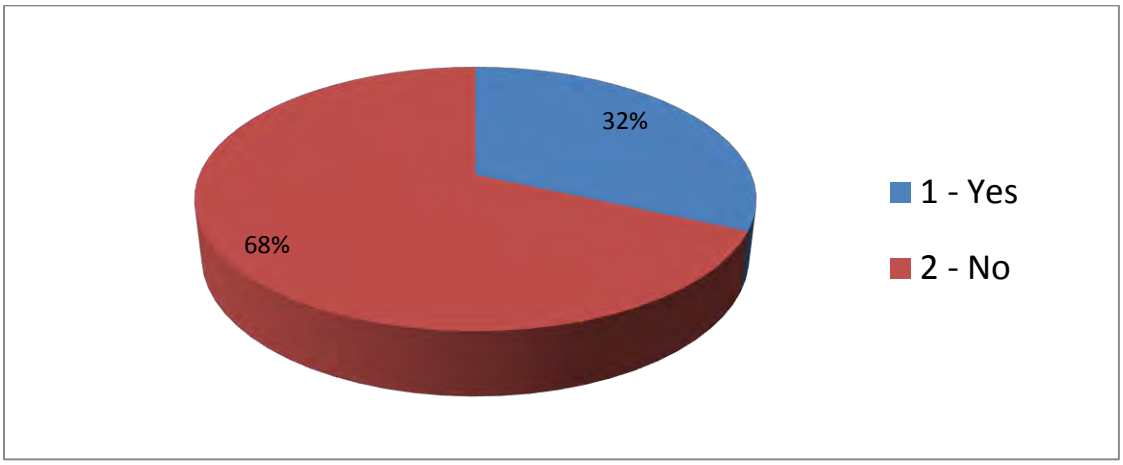
Figure 3: The percentage of respondents regarding whether they able to live environmentally responsible (2016)

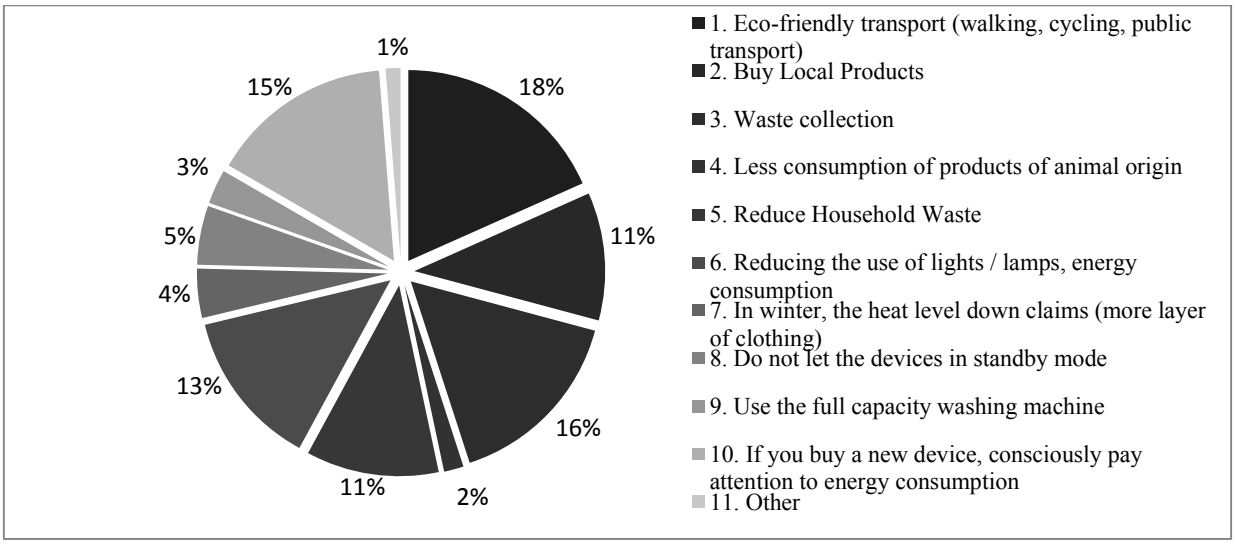


Source: Own research and compilation on the basis of primary questionnaire, 2016

Based on the results of Figure 3 the 68% of the respondents answered they are able to live environmentally responsible and they have the right behaviour. Roughly one-third said they are not living environmentally responsible or they do not have the opportunity to fulfill this behaviour. It mentioned in the responses received to the questionnaire how they can live environmentally responsible. Positive ways are: The minimization of energy consumption; improving the thermal insulation; energy-saving lamps; low-power car; solar energy and geothermal energy utilization rate of increase; selective waste collection; taking only the necessary products; increased use of public transport (Source: own research, 2016).

The other 32% who do not live environmentally responsible life had the following reasons as the downsides of the renewable and green energy: Buying solar panels are expensive; limited opportunities in occupied housing estates; the overhead reduction recovers can only be recoverable after many years (in case of solar panels 4-8 years); the technology is still expensive and not timeless; the energy saving is not enough incentive (Source: own research, 2016).

Figure 4: Methods which are the most effectively reduce the energy consumption and the environmental impact (2016)



Source: Own research and compilation on the basis of primary questionnaire, 2016

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Figure 4 illustrates the opinion of 240 respondents who filled in the questionnaire about the methods which the most effectively reduce the energy consumption and the environmental impact in case of Eger, Gyöngyös, Heves and Hatvan towns which can be found in Heves County.

The result of Figure 4 shows that the Eco-fiendly transport as method which include walking cycling and public transport has the highest rate of usability. It means the 18% of respondents answered that the Eco-friendly transport can effectively reduce the energy consumption and the environtmental impact. According to the respondents the second most effective method is the appropriate waste collection which is 16% compared to the 100%. The third method is if we buy a new device we have to consciously pay attention to the energy consumption. The respondents' opinion shows this also has a high rate of importance (15%). Furthemore also important methods the reduction of the use of lights (13%), the buying of local products (11%) and the reduction of household waste (11%). The other methods like the usage of devices in standby mode (5%), the heat level down claims in winter (4%), using the washing machine in full capacity (3%), less consumption of products of animal origin (2%) are not significantly important according to the respondents.

4. Conclusion

Based on the above studies and primary researches it concluded that for Heves County of renewable energy as a concept, is not yet sufficiently widespread. In this study I focused on the major cities of Heves County like Eger, Gyöngyös, Hatvan and Heves. It can be concluded that the renewable energy as definition and as technology in Eger and Gyöngyös it has been used quite a high percentage like 67% and 60%. In case of Hatvan and Heves these percentages are 52% and 42% which means the respondents who answered the survey from these two towns do not know the definition of renewable energy well yet.

As regards the future it is a must to get more knowledge about renewable energy and about that also how it can help to live environmentally responsible life or change our behaviour if we still not live like this. Figure 4 helped to illustrate 10 different methods which are effectively could reduce the energy consumption and the environmental impact. The three most effective methods are the Eco-friendly transport, the appropriate waste collection and the importance to consciously pay attention to the energy consumption when we buy a new device. At the moment I was only be able to make my primary research in four different towns comparing them together but in the future I have plans to extend my researches to bigger areas, regions as well.

We should take notice of how we can do more for the development of environmental awareness. I examined four major towns in Heves County where the 68% of the respondents of the survey already live environmentally friendly noticing really good options to help the environment for example the minimization of energy consumption or the solar energy utilization rate increase. But on the other hand there are the other 32% of respondents who are not living environmentally friendly or just simply they do not have the opportunity to find solutions to live in this way.

It is a must to encourage all people to choose to live in this way if they have the opportunity. This will not only serve their own interests, but also everyone including future generations as well who want to use the same environment (Laughlin, 2011).

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Marketing novelties in promoting traditional meals

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Abstract
Traditional food is exactly what the label says – traditional. As expected we don't see many changes, innovations when it comes to this type of market. Therefore, in this paper and on our practical research and application, we tried to combine traditional food made by traditional methods with brand new marketing trend – Augmented reality.
Few of the most popular typical food products and meals will be supported in a way of using augmented reality as absolutely new way of delivering additional information and experience to customers. Augmented reality project will be tested during the pilot event Visegrad dinner and presented during Visegrad summer school.

Keywords: *augmented reality, food marketing, mobile applications, traditional food, Visegrad*

JEL Classification: *M31*

1 Introduction

With the growing acceptance of multimedia and the Internet, the marketing field is moving from traditional material way of approaching consumers (e.g. magazines, newspapers, etc.) into new digital era. According to eMarketer (www.eMarketer.com, 2012), the digital market grew by 23% last year, although that's expected to be slow. Few years later nobody knew about social media, which are now inseparable part of many people's lives and only one of them, Facebook has a value of around 279.40B in something over three years[1]. They are using the growth of mobile devices and social media (Lenhart, Purcell, Smith, & Zickuhr, 2010) to create new forms of advertising campaigns and promotions and are moving into mobile communication lately, as their profits from this branch of communication are increasing[2]. Therefore, in this paper we would like to focus on one of the most promising mobile technology – Augmented reality. We believe augmented reality to be the next big thing not only in mobile marketing, but especially in marketing of traditional food, where it can connect traditions with modern approach.

1.1 Definition of Augmented reality

First of all we have to separate two very similar concepts, which are augmented reality and Virtual reality. According to Karimi, et al., (2004) Augmented Reality (AR) is related to the concept of virtual reality (VR). VR attempts to create an artificial world that a person can experience and explore interactively, predominantly through his or her sense of vision, but also via audio, tactile, and other forms of feedback. AR also brings an interactive experience, but aims to supplement the real world, rather than creating an entirely artificial environment.

For the purpose of this paper, we follow the definitions of Azuma (Azuma, et al., 2001). We will define an AR system as a system, which supplements the real world with virtual (computer-generated) objects that appear to coexist in the same space as the real world. While many

[1]http://ycharts.com/companies/FB/enterprise_value
[2]http://www.businessinsider.com/half-of-facebooks-revenue-now-comes-from-mobile-advertising-2013-10

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researchers broaden the definition of AR beyond this vision, we define an AR system to have the following properties:

- combines real and virtual objects in a real environment;
- runs interactively, and in real time;
- and registers (aligns) real and virtual objects with each other.

1.2 What is Augmented Reality & how it can be used in marketing

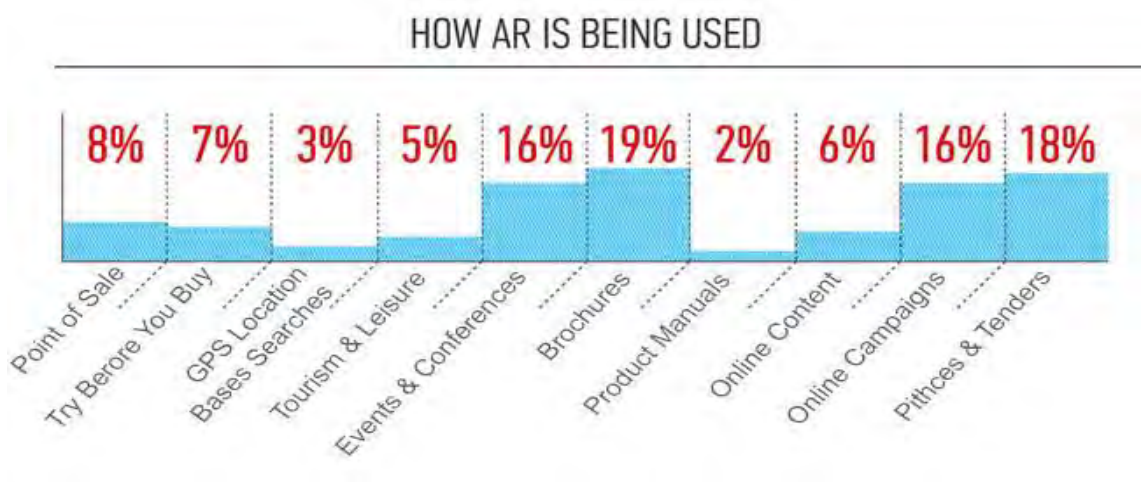
Economists theorize, that the world currently finds itself in the "experience economy" (Yuan & Wu, 2008). Experiential consumption is based more on a holistic experience, recognizing both the emotional and rational motives of consumption (Schmitt, 1999) and customers does not always focus on products, because their "functional utility is either taken for granted or seen as irrelevant", (Denegri-Knott & Molesworth , 2010).

This has special mean in marketing of traditional food, where customer using AR can experience more from it even before ordering. Traditional approach is at best to show pictures of prepared food, but imagine to see it on a plate before you while waiting, to find out what ingredients were used or even see how it is prepared all thanks to your smartphone.

Augmented reality is strongly supporting the creation of a unique experience; therefore it is increasingly being used in creative ways for apps, games, and shopping experiences. It works by projecting computer-generated data and three-dimensional graphics into the real world. A computer or cell phone essentially becomes consumers' eyes and their entree into a multi-layered, three-dimensional experience. (Azuma, et al., 2001)The visual combination of what's captured real-time in the physical environment with that which is "augmented" creates very interesting results with many applications and possibilities. Some are more useful while others are simply fun.

However marketing experts and observers say augmented reality is much more than fun and games (Bulearca & Tamarjan, 2010). It offers an entirely new avenue for direct mail, an eye-catching and meaningful way to ensure that mail continues as a mainstay in multichannel communications, as shown on Figure 1: The use of AR in marketing.

Figure 1: The use of AR in marketing



Let's talk about numbers for a while. On the pictures above (Figure 1: The use of AR in marketing) and below (Figure 2: Awareness of emerging mobile technologies) we can see how

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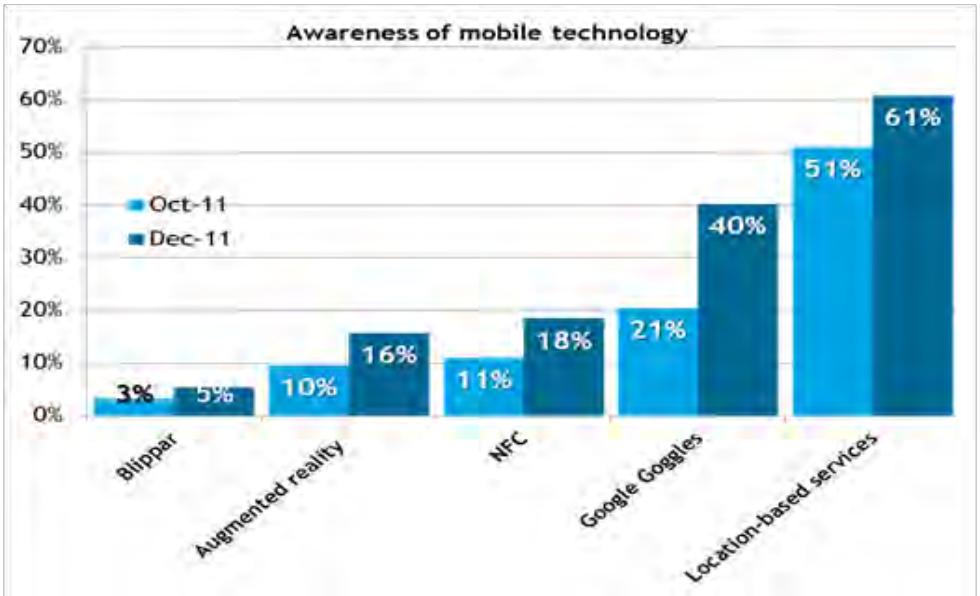
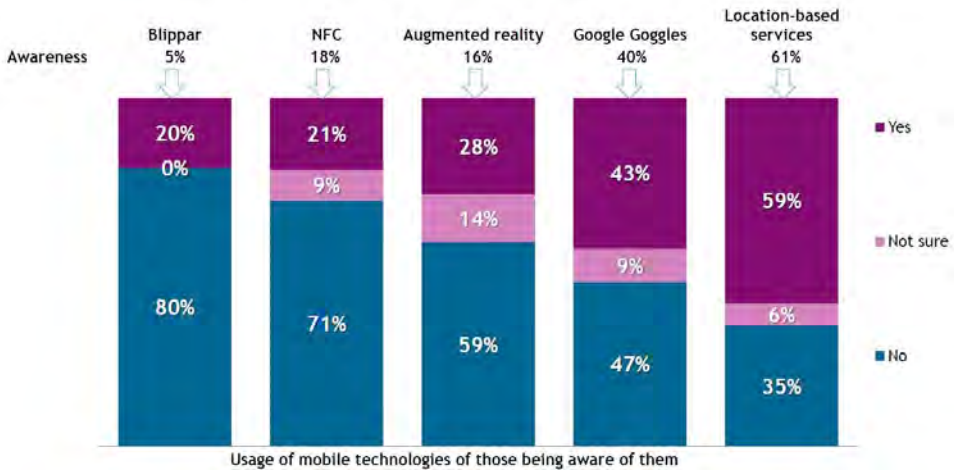
much people in UK know about these technologies. These numbers are the result of a research done by Kinetic Worldwide (Kinetic Worldwide, 2012) and shows that awareness of emerging mobile technologies is rising rapidly; 61% of consumers say they are aware of location-based mobile services up from 51% in October. Awareness of Google's Goggles service almost doubled to 40% between October and December. Knowledge of technologies such as augmented reality also increased (see picture below). They slowly become part of our everyday life through our smartphones, tablets etc. (SJB Research Ltd, 2014)

Figure 2: Awareness of emerging mobile technologies[3]



To not only show how many people are aware of these technologies, Kinetic Worldwide also made another in depth research (Figure 3: Usage of mobile technologies of those being aware of). They show how many people who are aware of these technologies are/would actually use them. As we can see almost half of questioned people (43%) would use Google Glass, which are basically Head mounted display (HMD) used to bring augmented reality even closer to our lives.

Figure 3: Usage of mobile technologies of those being aware of[4]



[3] (Kinetic Worldwide, 2012)
[4] (Kinetic Worldwide, 2012)

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These numbers are not only showing how important role these technologies play in our lives, but especially how fast are they evolving. Therefore we would like to present you with our proposal to an augmented reality app created to demonstrate the benefits of mobile technologies to traditional food marketing.

2 Advantages of augmented reality marketing in traditional food marketing

Augmented reality is still not widely used in promotion and especially not in promotion of traditional food, so for that reason it is still very early to talk about clear benefits of using this technology as a marketing tool but here are a few potential contenders:

- Personalisation: the customer can upload their own content to create a personalised form of media which is marketed at them only.
- Novelty: augmented reality is considered to be the 'latest thing' on the technology front so there is still that drive to be an early adopter.
- Socialisation: there is the opportunity for customers to share their experience with others, i.e. viral augmented reality marketing.
- Accessibility: it enables customers to get much more information about product or company just with their smartphone.

There is also 'customer experience' to consider: augmented reality can inject a playful, fun element into in an everyday product. It adds a sense of excitement to the process which appeals to a greater number of customers. This is the aim of marketing. (Virtual reality, 2009)

To show you, that AR is not only a fancy trend right now, which will soon fall into oblivion, but it is a valuable marketing tool with future potential we present you an excerpt of a research article published by Hidden Creative (Hidden Creative Limited, 2011). Hidden Creative is an immersive marketing and training company, they act as a brand butler for clients - bridging the gap between the business and the 'virtual' or 'digital' world.

2.1 Demand generation

A good website should be part of a digital strategy to acquire new customers or generate leads. When AR is used on websites, it increases dwell time and there is a proven correlation between the dwell time on site and conversions (e.g. sales, visits to the contact us page).

Advertising is changing and savvy advertising agencies are incorporating interactive elements into their artwork. Brands can incorporate an AR experience into an advert which then drives the user through to a website or provides them with a coupon or offer to drive footfall into store.

The events' industry is in decline and old fashioned; an exhibition is no longer as central to marketing budgets as it once was. Successful events and exhibitors are increasing interactivity at events which can increase dwell time on stand and directly help with lead generation.

2.2 Qualifying

Too many sales and marketing professionals under invest in sales and marketing collateral. Some innovative companies are choosing to invest in the sales process and make a good first impression by using AR to bring a presentation to life.

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Sales collateral can be static too but at the end of an AR experience it is possible to add data capture forms or refer people onto a website or contact page, thus supporting the sales process.

The credentials' meeting is the chance to impress and make an impression. Clearly an interactive web experience will not only captivate attention but as research shows, AR gives businesses a chance to put products into the hands of customers helping increase the likelihood to buy.

Product demonstrations might not be as high pressure as a pitch situation but it is still a selling opportunity. If it is impossible to demonstrate the real product then an AR experience can make an engaging alternative.

2.3 Proposing

Don't under invest in the pitch stage. Most sales professionals know it is better to do five great pitches than 100 average ones, so why not enhance a presentation with augmented reality?

There are some businesses that need to strip back costs from the sales process. For example, engineering firms spend hundreds of thousands of pounds on 3D product models. There are a number of leading engineering and construction firms who are investing in AR modelling instead which can be much more cost effective and take much less time to complete.

Again for some organisations modelling products for clients can be a major part of the job. Make the process quick impactful with AR.

2.4 Delivering

Selling doesn't stop when a client has been acquired. Most businesses are constantly trying to convince clients that their strategy is right or that their product design is the best solution. An augmentation of a proposed solution can be a sophisticated and persuasive way to communicate its benefits.

Truly global businesses come with their own challenges. Sometimes it is not feasible to fly out clients to visit a project site in China or Australia, or perhaps a project is being coordinated with teams which are located in different time zones. AR demonstrations can prove to be the death of distance and reduce the need for expensive international travel.

3 Disadvantages of augmented reality marketing

Augmented Reality, just like any other technology will have some incredibly beneficial uses and some absolutely useless ones. However, all forms of AR will likely be accompanied by some risks. Here are just five potential problems we can expect in the years ahead:

3.1 Privacy

The biggest issue with AR is definitely the privacy. With the use of facial recognition technology, combined with geo-location and augmented data will lead to a seamless integration of our online and offline lives. As a result of these developments, a person walking around in the physical world will no longer be just a physical body, but will be enhanced with a digital profile and other information that either the person itself or others make available online. We seem to not have anything holding us back to uploading everything about ourselves; where we live, who we hang around with, and even what we're doing at the weekend (Larkin, 2011). Imagine getting refused a loan in a bank or other institution; because they would be able directly find out from your personal social media page, that you were just fired from your job. Or imagine being picked out and harassed for additional security screening at the airport because of your blog, found on internet showing, your religion preference.

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3.2 Unauthorized Augmented Advertising

Advertisers and tech companies are very excited over the possibilities of monetizing objects & spaces in the physical world by augmenting digital ads onto them in real-time. "We think virtual advertising is a fascinating topic and potentially poised for high growth," says Anna Bager, vice president of the IAB Mobile Marketing Center of Excellence "and just as the IAB helped define the taxonomy of web advertising via banners, we will be ready to work with industry leaders to provide a value-added vision for the virtual future. While this is an exciting new advertising medium for brands, consumers will only want messages on an opt-in basis."

Once the general public gets used to navigating their physical environment with tools like Glasses, all of what we see and share will become searchable data. And when we combine consumer preference with predictive technology, Google will be able to serve visual experiences that benefit consumers and advertisers because of their unique specificity. (Havens, 2011)

Think of the physical and intellectual property rights implications if the technologies that drive augmented advertising do not come with inbuilt controls — controls that would prevent advertisers from augmenting their marketing messages on building surfaces and other physical objects (including private or public property or other trademarked or copyrighted material) without adequate permission.

3.3 Augmented Behavioural Targeting

The intention of behavioural targeting is to track users over time and build profiles of their interests, characteristics, such as age and gender, and shopping activities. (European Network and Information Security Agency, 2012)

With the emergence of smartphones, many applications record users' locations and movement. Location information enables many useful services such as driving directions, knowing where their friends are or recommendations for nearby restaurants. However, this information is also collected by marketers to improve profiling. While the benefits provided by these systems are indisputable, they unfortunately pose a considerable threat to location privacy, as illustrated by the recent iPhone and Android controversies (Raphael, 2011)

With targeting based on real world behaviour using a combination of geo-location data & publicly self-disclosed information via social media services the following example is not a very distant future. Let's assume you live in Nitra, travel a lot and have been checking into the local airport via services like Skyscanner, Pelikan or some other search servers every time you leave town. Let's also assume you have been checking out websites selling home security systems lately. Thanks to your online activities and your eagerness to share, you get served an ad that states "Given your busy travel schedule & the rising crime rate in Nitra, don't you think it's high time you installed a home security system?" (Actually this example may not be that distant future considering sites like Please Rob Me have emerged). It does raise questions though. Who would have to provide privacy notice and choice in this scenario and how would you control what information is collected and how it is used for advertising that blurs the boundaries between your physical and virtual worlds?

3.4 Physical danger

Like mobile phones or any other mobile media technology, AR devices also pose some real physical threat. There are threats not only in form of an electromagnetic field generated around the devices but also the problem of distractive effects. If you think mobile phones are currently a distraction while driving a car, think of an augmented windshield feeding you driving directions, along with more data about your surroundings than you may need. Or imagine

crossing a busy street in an unfamiliar neighbourhood, while simultaneously using an Augmented Reality interface to look for that hot new restaurant, checking out what people are tweeting about it and being bombarded with ads through it all.

3.5 Spam

Yes — where there is a marketing opportunity, there will be spam, deceptive advertising techniques and social engineering tricks to dupe gullible consumers into paying for things they don't really need. If you think too many legitimate Internet companies (that are sensitive to your privacy concerns) are harvesting all the data you publicly share on the Internet, there are even more scammers out there doing the very same thing. Be ready to be tricked and duped by too good to be true augmented offers in the real world — offers that will lure you in ways that unsolicited email from online pharmacies or belly-fat banner ads only wish they could. (Zacharias, 2010)

The AR technology, as we mentioned, has a great potential in the future not only in marketing field but in all aspects of our lives. As such it can't be let to coincidence to decide into what it will evolve. Responsible people should decide whether it will be a useful tool, which will help us in our lives, or it will become source of harassment and abuse from companies, hackers and even our fellow surrounding.

4 Methodology and aim

This research is a short overview of theoretical possibilities as well as supporting paper for further practical research. At the time of submitting the paper we are still working on the creation of augmented reality traditional food presentation app. Creating an app like this a software development kit is needed (SDK) to program, build and publish the app. To accomplish this, given our resources and technical skills, we have chosen two of these SDK's namely Aurasma studio (https://studio.aurasma.com/home) and/or Zapcode (https://zapcode.it/). Both of the SDK's offer relatively easy app creation studios, while do support 3D objects inclusion. Next we needed to fill the app with appropriate media and content to bring alive traditional dinner. Our ultimate goal with this app is to bring unique experience to users and show possibilities and find out shortcomings of augmented reality. While that is our main goal we will also use the app to gather usage data for further research.

5 Conclusion

The aim of this paper is to further elaborate on this novelty topic, bring some clear definitions and present possibilities as well as disadvantages of use of augmented reality. Our other aim is to create a practical example of an augmented reality app and present it on International Scientific Days 2016 in Nitra. Gained data from this event will be then further analyzed and used for following research.

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A study of negotiation mechanism based on science of momentum

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Abstract

"Momentum Creation" is one of the core concepts used by intellectuals through the ages to describe the growth process of all things on earth in the Chinese traditional culture. Laozi pointed out in his Scripture of Ethics that "The Way bears all things; Harmony nurtures them; Nature shapes them; Use completes them" and told us the basic principles of momentum creation, those are, "Heaven by it is bright and pure; Earth rendered thereby firm and sure; Spirits with powers by it supplied; Valleys kept full throughout their void; All creatures through it live; Princes and kings from it become leaders". "Get One" means unity and conformity. "Get One" in momentum creation is to find inherent unity and conformity among hugely different objects, to connect different objects with the same reasoning. In other words, the uniform law should be used to control all things on earth, or the same ideology to govern them. Professor Li Dechang from Xi'an Jiaotong University created the science of momentum, which means the study of generation and operation mechanism of momentum. From the scientific logic perspective, social development is achieved through momentum, which equals difference divided by distance or difference times relations. In order to provide effective theoretical support to negotiation research and practice, the author is to explore negotiation mechanism based on the momentum of science and the law of momentum science in negotiations through the research of four-stage model of successful negotiation.

Key words: *negotiation, momentum science, mechanism*

JEL Classification: *M31*

1. Introduction

Negotiation is a dialogue between two or more people or parties intended to reach a mutually beneficial outcome, resolve points of difference, to gain advantage for an individual or collective, or to craft outcomes to satisfy various interests (Buettner, 2006).Negotiation has a long history. Since there were communication activities in human societies, negotiation activities occurred. An increasing number of disputes need to be resolved, such as tribal fight, commodities exchange, ownership and territorial dispute, hostage, labour-capital issues, diplomatic relations, women's rights, international status, etc. When people do not want to resort to force to resolve conflicting interests so as to acquire harmonious development, the method of solving conflicts through negotiation comes into being. Thus, negotiation, as an effective meaning of resolving conflicts, has been extensively used in every aspect of social life.

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In terms of negotiation research in China, theoretical researchers tend to emphasize the integrative comprehensive feature of negotiation involving such disciplines as; law, language, psychology, culture, politics and economy while practical negotiators research the generalization of experiences(Xia, 2005). Although negotiation research has been much favoured by theorists and practitioners, due to a variety of reasons, many negotiation books are about the pileup of strategies and enumeration of skills and negotiation personnel just copy negotiation experiences blindly and apply negotiation experiences mechanically. In view of the current situation of negotiation research and practice in China, negotiation research is still at the perceptual and descriptive stage, lacking scientific mechanism exploration of negotiation.

Since most of the literature on negotiations in an international environment has a common opinion that Chinese culture and Western culture is different on negotiation（such as(Mintu-Wimsatt & Calantone, 1995; Pan; Su, 2014; Torres, 2010)）, this study focuses on their connection from a Chinese perspective. In order to provide effective theoretical support to negotiation research and guidelines for practitioners to apply negotiation strategies, the author is to explore negotiation mechanism based on the momentum of science and the law of momentum science in negotiations.

2. Laozi's Momentum and Science of Momentum

2.1 Laozi's Momentum

"Momentum Creation" is one of the core concepts used by intellectuals through the ages to describe the growth process of all things on earth in the Chinese traditional culture. Laozi (Shankman, 2006)pointed out in his Scripture of Ethics that "The Way bears all things; Harmony nurtures them; Nature shapes them; Use completes them" . If the assumption of setting up a certain economic organization is based on initiators' in-depth investigation and analysis of the markets according to basic economics principles, it is derived from the "way", e.g. "The Way bears all things"; if establishment process of economic organization is based on the ethics of fair game and market regulations, which is, "Harmony nurtures them"; the establishment of economic organization needs a certain amount of money and materials, which is called "Nature shapes them." Finally, organizational success must be accomplished under the force of strong culture and management momentum of the organization, which is called "Use completes them".

Laozi gave us the basic principles of momentum creation, which are, "Heaven by it is bright and pure; Earth rendered thereby firm and sure; Spirits with powers by it supplied; Valleys kept full throughout their void; All creatures through it do live; Princes and kings from it become leaders". "Get One" means unity and conformity. "Get One" in momentum creation is to find inherent unity and conformity among hugely different objects, to connect different objects with the same reasoning. In other words, the uniform law should be used to control all things on earth, or the same ideology to govern them. Should such momentum be created, the sky would be fine, earth serene, God effective, valleys full, all things growing, and kings winning the whole world.

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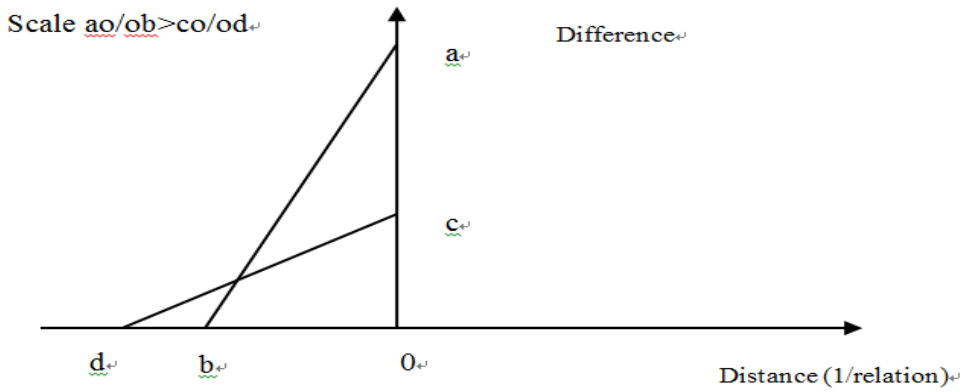
2.2 Scientific Momentum

Professor Li Dechang in Xi'an Jiaotong University created momentum science based on the idea of Laozi's momentum (science of study on the creation and operating mechanism of momentum). From the perspective of scientific logic, momentum is a scale where the algebra formula scales equal differences divided by distance. Since distance and relation are reciprocal with each other, its formula can be rewritten as momentum equals differences times relations. Scale's mathematical expression are differences between two elements divided by distance with horizontal axis denoting distance and vertical axis differences.(see Fig.1) Since relation and distance are derivatives, line cd shows loose relations with fewer differences while line ab close relations with more differences(Dechang, 2007). Therefore, scale ao/ob is bigger than scale co/od. Scale is slope in geometry and derivative in calculus.

Figure 1: Momentum=Scale=Difference÷Distance=Difference×Relation



Source: Li Dechang.2007.New Economy and Initiative Quality--Education, Management and Initiation under Perspective of MomentumScience[M].Beijing:China Metrology Press.

Basic principles of momentum creation of systems are: widen differences and strengthen relations among system elements. Its principles can be expressed as followed: the development of the universe is pushed forward by momentum on all levels, which equals differences divided by distance or differences times relations. The operating rule of momentum is that differences promote relations and relations enlarge differences. Therefore, the stable momentum will lead to rapid expansion of the universe and swift development of the society. When the stable growth of momentum reaches a certain point, the system will have a unbalanced phase transformation and non-linear divergence, giving birth to different kinds of qualities, innovation and risks. Growth limit of momentum produces symmetry, forming groups of mathematic structures. Undisturbed material momentum form material groups, which leads to a harmonious universe. Undisturbed information momentum forms quality groups, organization groups and social groups, thus pushing forward the harmony of quality, organization and society.

3. Scientific Mechanism of Negotiation Momentum

Negotiation is a behaviour and process in which people try to reach an agreement through consultation in order to co-ordinate relationships of each other and satisfy each other's

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demands. According to the scientific momentum theory, negotiation is a process of communication and consultation. Communication is momentum creation, through which huge different demands are connected and each negotiation party brings forward the company goal important to the other party(maximum differences) and most likely to be realized(maximum probability and relations). The larger amount of communication information, the higher the communication efficiency, thus the larger the momentum creation. Communication is a driving mechanism to develop negotiation organization through which people seek help from negotiation organizations to scale relationship of negotiation organization. Decision-making is to have paths variation to choose a shortcut to reach the goal. The negotiation process is an integral one in the constant momentum creation. The following is a further analysis of momentum mechanism in negotiation process in line with the four stages of successful negotiation.

3.1 Preparation Stage (no contact between two negotiating parties)

Negotiating parties can be simplified as A and B(see fig.2, fig.3). In the preparation stage, the two parties establish respective negotiating goals based on their respective negotiation situation. Negotiation goals are the differences between initial state and negotiation future (ideal state) according to momentum science. The higher the negotiation goal, the bigger differences between negotiation expectation and present state, which is shown by vertical axis. Although there is no formal contact between negotiation parties in the preparation stage, objectively there exist various kinds of differences such as outward appearance, behavior, inner values, personality, social life environment, education, economic status, etc. Generally speaking, the smaller differences in these aspects, the smaller distance, consequently, the closer relations in future formal negotiation, which is shown by horizontal axis.

Parties A and B have formed their respective momentum after preparation. The higher goal set by the party itself, the shorter distance with the other party(close relation with the opposing party will cause their stronger need on our party), thus, greater momentum is created and vice versa. Naturally, as for negotiators, if the negotiation goal is set too high(scale is 1), the negotiation goal is impossible to realize; if there is no distance with the other party (the same relations and scale is 0), there will be no need to negotiate. Negotiation momentum should have a range(scale is between 0 and 1).

Figure2: Negotiation Party Concerned A

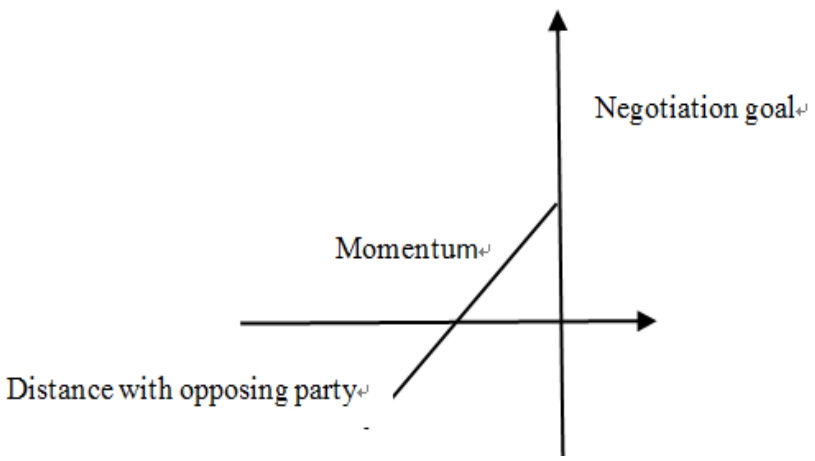

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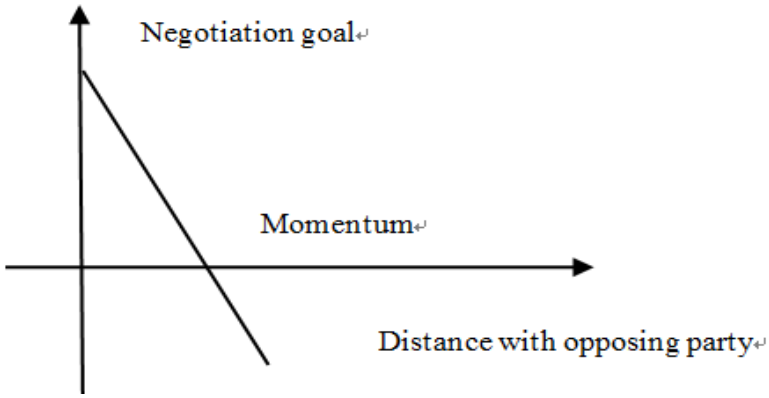
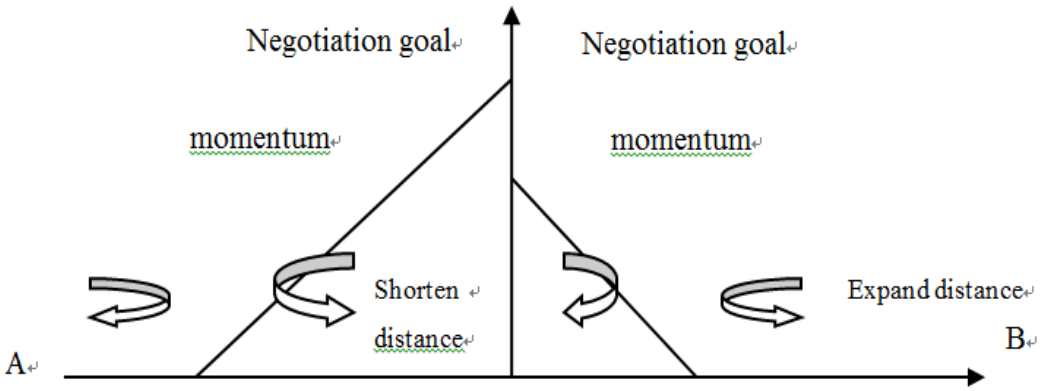
Figure3: Negotiation Party Concerned B



3.2 Opening Stage

Having set their respective goals, the two negotiating parties are going through initial contact. First of all, negotiating parties need to find out the real situation about each other so as to form a kind of negotiating atmosphere when three kinds of momentum changes could occur: momentum increases when parties shorten communication distance; momentum decreases when they expand it; one party increases momentum while the other party decrease it when they have divergence.

Figure 4: Momentum Change Picture in Opening Stage



3.3 Bargaining Stage

Entering bargaining stage, the two parties adjust their negotiating goals respectively through further communication. Negotiation distance is shortening while the whole negotiating momentum is strengthening. At this moment, negotiating parties are exchanging negotiating projects, making possible decisions, distinguishing paths and choosing a shortcut to the desirable goal.

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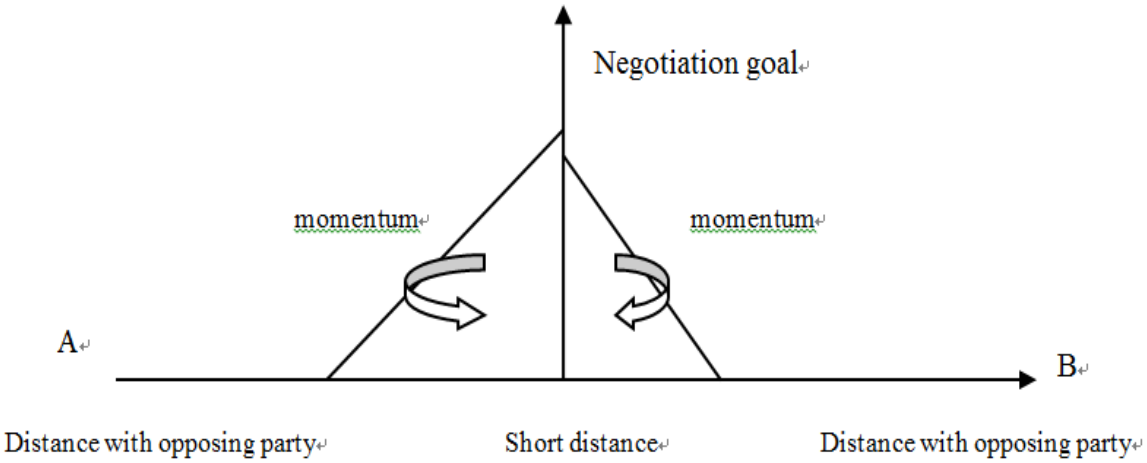
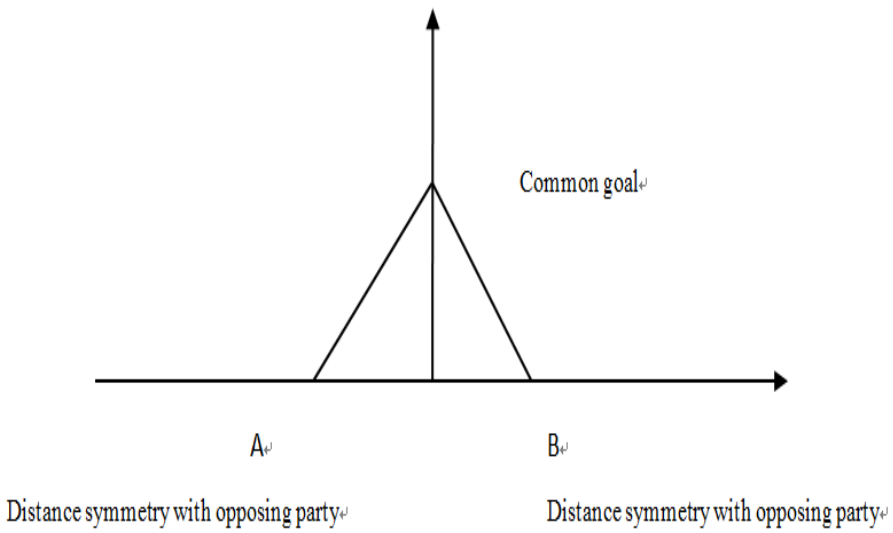
Figure 5: Momentum Change Picture in Bargaining Stage



3.4 Closing Stage to Reach a Win-win Result

After smooth negotiation, negotiating parties reach a mutually satisfactory agreement on a certain negotiating point when they, interconnecting with each other, have reached common goals to form an agreement of mutual benefit. Distance symmetry form stable negotiating symmetry--negotiating triangle. From the perspective of momentum science, growth limit of momentum produce symmetry, which form groups of mathematic structure. Win-win result of negotiations form benefit groups of mutual benefit.

Figure 6: Negotiation Win-Win Result-Negotiation Triangle



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4. Scientific Negotiation Strategies Based on Momentum

4.1 Establishment of negotiating goals can be neither without momentum nor with too much momentum in the preparation stage

In the preparation stage, the key is to set respective negotiating goals. According to the ideas of momentum science, momentum is caused by scale, whose nature is "relations in differences" or "differences in relations". There will be no scale without differences and vice versa. In addition, irrelevant differences will lead to no scale. In the preparation stage, if the negotiating goal is set too low and easy to realize in reality, there will be no need to go into negotiation. No scale (horizontal line, 0 scale) means no negotiating momentum. Conversely, if it is set too high, an extremely ideal goal (vertical line, 1 scale), which has a large gap with actual conditions, will be difficult to realize. Therefore, the establishment of negotiating goals should be set within a reasonable range (somewhere between 0-1), leaving room for manoeuvre for negotiations. Ideal negotiating goals cannot be an exorbitant price unable to realize, causing frustration and scaring away negotiators. At the same time, the bottom-line goal cannot be too low to have any difficulties, failing to inspire their own negotiating desire and at the same time, lessening interest of negotiation opponents. The reasonable negotiation goal should be a little bit above the possible negotiating goal with a little difficulty.

4.2 Negotiation is shortening distance (focusing on relations and commonalities) to accelerate momentum in the opening stage

Having met each other for the first time, the negotiating parties will have initial communication when they are supposed to be aware of the importance of shortening distance (focusing on relations and commonalities) to accelerate momentum. Since there is an increasingly larger personality differences in organizational elements, it will be increasingly difficult to connect people with different personalities. But once communication is done, negotiating momentum created will be greater, which will accelerate in-depth negotiation. If the growing momentum of communication cannot be reached at this stage, negotiation will come to a sudden end or waver without any progress.

The general strategy in the opening stage is to create favourable negotiating atmosphere. Seen from momentum science, the establishment of trust at this stage is to shorten psychological distance. At the beginning of negotiation, people have various kinds of distance reflected in such aspects as status, identification, knowledge, wealth, values, religion, etc. The starting point of negotiation is to acknowledge differences while in the opening stage, people tend to reduce and overcome differences to find common ground. Modern Communications brings forward "host-guest cooperation model", in which the process of negotiation is viewed as the process of mutual cooperation and negotiating effect is the result of mutual cooperation. Moreover, negotiating parties are regarded as cooperators instead of opponents. The host should aim to fully understand and respect the guest. The condition of host-guest cooperation is to find common ground for both parties and shorten their psychological differences, which serves as a bridge to go beyond differences. Disparities should be removed by the means of searching similarities, relations, common goals and appropriate methods so as to set up good interpersonal relationship and acquire better opportunities to deepen negotiation.

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4.3In the bargaining stage, negotiation is to create momentum through decision-making

With the deepening of negotiation, negotiating parties bargain with each other, which means a constant decision-making process. No matter when and where, only when the chosen object is ranked according to a definite scale(momentum creation) people can have an effective choice, because decision-making needs momentum creation. Seen from the essence of choices, the nature of momentum creation is to let the organization have the function of choice. On the other hand, the basis of decision-making is choice, whose basis is to provide multiple projects. Huge momentum should be created for the system to come up with multiple projects. Decision-makers must make use of their resources and knowledge to connect various kinds of elements in order to create huge momentum. Only in this way the system can form non-balanced change and non-linear divergence, design multiple projects available for selection and finally make decisions. Likewise, once sound policy is made, it is possible to connect closely various kinds of resources and elements on higher levels.

The bargaining and decision-making process is the process of project-creation. A good project is like a catalyst in negotiation, enabling the two parties to reach an agreement quickly. An excellent negotiating project can reflect mutual benefits of the parties. Simply put, it is to let the other side unable to refuse but to accept one's won requirements and meanwhile satisfy one's own benefits. Creative projects do not come from a sudden flash of light, but from negotiation feeling formed by detailed analysis of common benefits as well as experience accumulation. The negotiators' duty is to provide creative solutions in order to create momentum. There is no plain sailing in the area of negotiation in which divergence and bumpy are common occurrences. Whoever puts forward an alternative project creatively---of course, the alternative project has to maintain self-interest effectively and consider the other side's benefits as well, he/she takes the proactive position in negotiation. Do not try to specify the best alternative at the beginning, which will usually hinder production of many other possible alternatives. On the contrary, in the bargaining stage, more beneficial projects need to be produced to push forward negotiation smoothly. Once obstacles are in the way, you need to shift the bow in time in order to reach the destination without fail.

4.4 In the closing stage, negotiation is to pursue momentum growth limit to produce symmetric interest groups

The final result of negotiation is win-win, which in nature is to produce projects and integrate resources through decision-making and find the best balancing point of mutual benefits, interest groups, as to speak. Only when interest groups are constructed can people complement and support each other with an aim of mutual promotion and common development. When people seek the solution to maximum benefits of their own, they also satisfy maximum benefit requirements of the other party. I am in you and you are in me, finally forming a stable interest group.

In each negotiation lays respective common interests, which are not possibly obvious. Negotiators should make efforts to seek opportunities of cooperation and mutual benefit. Common benefit contributes to negotiating parties reaching an agreement in which an idea able to satisfy common benefits will be beneficial to both parties. During the interaction of negotiation communication, each party exchanges information, makes compromises,

coordinates benefits and finally forms a common entity of interest on a certain interest point, realizing an interest equilibrium. Successful negotiation requires negotiators stick to their own interests but at the same time stick not to their own opinions. Therefore, negotiation should be viewed as a mutually-beneficial event, making efforts to realize common goals. However, there exist benefit conflicts among participating parties, in which case, each party must argue strongly on just grounds with the other party, otherwise, their own benefits will be damaged. Consequently, cooperation does not discard conflicts. On the contrary, conflict is a balancing method since many negotiations start with conflicts and cooperate with each other after common interests have been found. There will be an exchange between conflicts and cooperation in the process of negotiation where conflicts can be turned into cooperation and cooperation into conflicts. The extreme end of conflicts leads to end of negotiation and use of non-negotiation methods while the removal of conflicts makes negotiating parties form common ground, opening a passage to reach an agreement. So negotiation is a process of competition and cooperation where there is cooperation in competition and competition in cooperation. Everything develops and is unified in conflicts, so is negotiation that reaches maximum limit of momentum to realize benefit equilibrium.

5. Conclusion

This research proposes an innovative negotiation theory of Science of Momentum based on the Laozi's Scripture of Ethics ,the essence of traditional Chinese culture, and the research of science of momentum by Li Dechang, the professor of Xi'an Jiaotong University to explain the behavior in negotiations .The system of science of momentum provides a clear theoretical support for the four stages of negotiation activities including preparation, start, consultation, and ending ,meanwhile provides effective negotiation strategies of science of momentum for negotiation practitioners. With the pace of economic development in China going ahead and the trend of Chinese enterprises' international operations emerging, negotiation activities are inevitable in the process of internationalization of the enterprises, and guidance of negotiation theory is needed for the negotiation success, and it is easier to understand and apply for Chinese to guide the negotiation activities whit the theory based on Chinese culture. Besides, it is a new theory of negotiation in the perspective of Chinese cultural that can enrich the theoretical system of international business negotiations.

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