

STRUCTURE OF AGRICULTURAL PRODUCTION AND DEMAND FOR LABOR IN CENTRAL AND EASTERN EUROPE

K.SZEGÉNYOVÁ¹, F. KUZMA¹

¹ Slovak University of Agriculture in Nitra, Slovak Republic

ABSTRACT

The main objective of this paper is to analyze the agricultural labor market in Central and Eastern European Countries (CEECs). In CEECs dual structure of farms exists. There are large corporate farms (CF) and small family farms (FF). In CEECs the crucial choice is not between farm organization, but rather what production structure is chosen by each farm. Both CF and FF usually specialize in commodities in which they have comparative advantage. Comparative advantage of FF relative to CF stems from the existence of transaction costs and from two problems causing them: adverse selection and moral hazard. These are related to recruiting, monitoring, and supervising workers, and occur among farms using hired labor. Farms using only own labor usually do not suffer from moral hazard problem. That is why CF specialize in products with low labor monitoring and FF specialize in products with higher labor monitoring requirements. A key focus of this paper is the determination of farm size, demand for labor, and production structure in CEECs.

Key words: corporate farms, family farms, transaction costs, moral hazard, production structure

1 INTRODUCTION

Agriculture plays a central role in a nation's natural resource base of every country. Agriculture is multifunctional and its social and environmental impacts receive increased attention especially in Central and Eastern European Countries because these countries have been undergoing very long and complex process of transformation in 1990s. Other dramatic changes brought the accession of some of these countries to the European Union over the last decade (2004 or 2007, with the exception of Belarus, Moldova and Ukraine). Before the enlargement of the EU by CEECs, EU had to raise some agricultural issues. They had to evaluate the relative competitiveness of CEEC agriculture, its potential and readiness of candidate countries for accession to the EU agricultural markets.

Under the communist economic system great part of the agricultural sector of CEECs was collectivized and dominated by large corporate farms or state-owned cooperatives. But after the transition of agriculture, the most significant change was that these cooperative farms were transferred to private owners. It means that we can see two types of farms in CEECs – large corporate farms and relatively small family farms. In this paper we found out that in 1990s the dominant farm structure in most CEECs was CF (with the exception of Poland and Slovenia, where FF prevailed). But this has changed since transition until today. One of the main aims of agricultural reforms was to transform CF into FF. This transformation is motivated by the theoretical incentive analysis of farms of different organizational forms in market economies, which suggests that FF can be expected to achieve higher levels of productivity and efficiency than CF.¹ This goal was achieved in most CEECs but there are still some countries where CF prevail: Belarus, Bulgaria, the Czech Republic, Slovakia and Ukraine. It is because of poor performance of agriculture in these countries and also because of their inherited preference for CF. According to the farm structure we also provide the share of these farms on gross agricultural output. This was also dominated by CF in the past but the

share of FF and CF on GAO changes with the change of farm structure. One of the main targets of the EU in this field is to modernize this sector for the world market through its Common Agricultural Policy.

In the field of competitiveness of agricultural production we want to highlight the fact that each country usually specialize in production of those goods which require intensive use of the country's abundant factors. It means that a relatively capital abundant country will produce and export capital intensive goods while a relatively labor abundant country will produce and export relatively labor intensive agricultural products.² In this paper we are also trying to imply this theory in relation to the farm structure.

In final section we focus on the labor force as one of the most important factors affecting the performance of agriculture. In both, CF and FF the changes in land use are strongly correlated with the changes in labor use. The increase in labor in individual farms, especially after 1998, is linked with the land distribution efforts, which focused on the conversion of land share certificates into physical plots. This trend in CF and FF have resulted in a sharp increase of the share of agricultural labor in the individual sector.

When talking about labor force in agriculture we have to mention the transaction costs. These usually arise due to information problems of two types: adverse selection and moral hazard, and determine the extent to which family labor is advantageous over hired labor and thus the demand for labor. Transaction costs involve the costs of recruiting, monitoring and supervising workers and are usually related to farms using hired labor.

The character of this paper is entirely descriptive with some statistical data on the performance of agriculture in CEECs with an emphasis on the farm structure, the structure of agricultural production and its competitiveness and on the situation in agricultural labor market.

Notes

¹ **Allen, D.W., Lueck, D.** (2002), *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture*, Cambridge, MA, MIT Press.

² **Ciaian, P., d'Artis Kancs, Pokrivčák, J.** (2008), *Comparative Advantages, Transaction Costs and Factor Content of Agricultural Trade: Empirical Evidence from the CEE*, EERI Research Paper Series 2008.

2 BASIC INFORMATION ON AGRICULTURE

In 2007, agriculture utilised over 172 millions hectares of land in EU-27 of which 60% were dedicated to arable crops, 32% to permanent pastures and 6% to permanent crops.³ We provide essential information on agriculture in CEECs in Table 1: Main characteristics of agriculture for holdings of at least 1 ESU. Here we focus on four basic indicators and we also provide the explanation of the terms or units used in the table according to the Farm Structure Survey. The FSS is held across all member states of the EU four times every decade and is funded by the European Commission. The latest survey was conducted in 2007.

The first column of Table 1 shows the Utilized Agricultural Area which is the total arable land, permanent grassland, land used for permanent crops and kitchen gardens. It excludes unutilised agricultural land, woodland and land occupied by buildings, farmyards, tracks, ponds, etc. It depends only on the area of each country and on its geographical conditions and is measured in hectares. The next two columns are dedicated to the number of agricultural holdings in total and the agricultural holdings of at least one European Size Unit. Agricultural holding is a technical-economic unit under single management engaged in agricultural production.⁴ The number of agricultural holdings is influenced by the UAA of the country (the largest countries are Poland and Romania and that is one of the reasons why they have many agricultural holdings) and also by the structure of the farms. If there is a large number of small family or individual farms, as it is in case of Latvia, Lithuania or Slovenia (even though these countries are relatively small) we can say that there is also many

agricultural holdings. On the other hand, if the area of the country is small (Estonia) or there are mostly large corporate farms (Czech Republic) there are fewer agricultural holdings. Due to the different coverage of the FSS across EU member states, the total number of farms is not comparable between countries and that is why the table focuses only on holdings of at least 1 ESU. ESU means that for each activity on a holding, a standard gross margin is estimated, based on the area (or the number of heads) and a regional coefficient. The sum of all margins, for all activities of a given farm, is referred to as the economic size of the farm, expressed in ESU. Finally, we provide the information on the average area per holding which says what is the average size of a single farm. It is measured in hectares. The highest is in the Czech Republic, in the Slovak Republic and in Estonia.

These characteristics of agriculture in some CEECs constitute only the basis on which we will build in the next chapters of the paper.

Notes

³ **European Union** (2008), *Rural Development in the European Union. Statistical and Economic Information*. Directorate-General for Agriculture and Rural Development, Report 2008. Available on the Internet:

http://ec.europa.eu/agriculture/agrista/rurdev2008/RD_Report_2008.pdf, January 2010.

⁴ **European Commission** (2009), *Agricultural statistics–Main results–2007-08*, Luxembourg, Office for Official Publication of the European Communities. Available on the Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ED-09-001/EN/KS-ED-09-001-EN.PDF, January 2010.

3 DUAL FARM STRUCTURE IN CEECs

The structure of the farm size is one of the most important indicators for the competitive ability of the farm and its income efficiency. If we want to determine the farm structure and the structure of agricultural production, firstly we have to ask the question what is the difference between family farms and corporate farms. FF or individual farms are

usually small or even very small household plots managed by the farmer as a head of the household and his/her family members. They rely mostly on family labor and family-owned land or they can lease additional land from other owners. When talking about FF we cannot necessarily identify them with small farms. In connection with small farms we often use terms such as subsistence or semi-subsistence farming. These are usually defined as farmers who sell less than half of their production or who use their production mostly for home consumption. In contrast, CF are operated by hired professional managers, rely on hired labor, operate on leased land and have stronger commercial orientation. As a criterion of size classification we can use for example area, economic size or labor input.

In many developed countries FF dominate the agricultural sector. Many authors say that medium-sized farms are the pillar of any market agriculture because of their higher efficiency and higher productiveness.⁵ But in CEECs the situation was different. The average farm size was much higher and also the agricultural production was dominated by CF employing hired labor.⁶ These large CF are usually characterized as low productive and that is why the development of family farming became one of the most important issues in CEECs in 1990s and FF were expected to be the main outcome from the institutional reorganisation of socialised agriculture. On the other hand, some policy-makers and economists argue that the best CF can perform all farming activities as well as the best FF. This is a contrary to the statement that CF do not have an advantage over FF and that they are less productive.

In 1990s – the transition years, national agricultural production levels in all CEECs dropped rapidly as a result of system instability and failure of privatisation reforms. Despite all these programmes and policies, agriculture across CEE is still marked by dualism.⁷ It means that there are both types of farms: CF and FF. The other important issue is that it is not easy to turn large CF into FF because of the existence of transaction costs including those related to bargaining with the farm management, co-ownership or unclear boundaries. It

means that CF still hold the largest parts of land in CEECs and emerging FF face significant transaction costs to obtain land from the established CF.⁸ This also explains the dominant position of CF in CEECs before the reforms of agriculture. But as we can see from Table 2: Farm structure and Table 3: Share of CF and FF on GAO, the situation in CEECs has changed dramatically over the last periods. According to Table 2, in 1990s there were only two countries with prevailing family farming – Poland and Slovenia. In the rest of the countries different types of farms prevailed. There were cooperative farms, collective farms, state farms or corporate farms. These types of farms were large with many hired workers and significant areas of land. But at the beginning of the 21st century (we are operating with data from 2004 and 2005 because more recent data after the accession of some countries to the EU are not available and because not all CEECs are the member states of the EU – Belarus, Moldova, Ukraine), the situation has turned significantly in some countries. To understand the change in farm structure and consequently in the structure of agricultural output we have classified the countries into 3 groups.

The first group consists of Belarus, Bulgaria, the Czech Republic, Slovakia and Ukraine. In these countries big farms had the largest share of Total Agricultural Area before the years of transition and individual farms used only very small share of TAA. After 2000, small FF received some land but it was not enough to gain the decisive share. The relatively unfavorable conditions for individual farmers in matters of access to capital, inputs, and markets dissuaded many of them from exiting the CF and that is why the CF have persisted until today in these countries. But what is more important, there was an interesting change in the agricultural output in favor of FF. At the end of the 20th century, CF produced the significant proportion of GAO but in recent years this indicator is turning in favor of FF. It is especially the case of Ukraine and also of Belarus. In the Slovak Republic there is still higher number of CF producing the largest amount of GAO. The continued dominance of large-scale

CF may explain (at least in part) the relatively poor performance of Slovak agriculture even despite the fact that the Slovak Republic is one of the member states of the EU since 2004.⁹ Also the ideology of previous regime is still deeply implanted in the minds of all agricultural decision makers not only in Slovakia but also in Ukraine, the Czech Republic and Belarus.¹⁰

According to the farm structure and the share of the farms on GAO, to the second group we can put Estonia, Hungary, Latvia, Lithuania, Moldova and Romania. The change is here visible in both indicators. Before the transition there were mostly large farms with large share on TAA. In recent years FF have emerged in broader range. The most significant change occurred in Baltic states. If we take the GAO into consideration, in Estonia and Romania FF have produced larger amount of GAO before the transition and the situation is the same now. But in Hungary, Latvia and Moldova the shift of agricultural land from CF to FF noted in Table 2 has led to significant changes in the production structure. The output of CF has decreased, while the output of the individual sector shows growth. This means that FF use their land more productively than CF.⁵

The last group includes only Poland and Slovenia. In these countries FF have always been dominant and so it is today, even in a wider range. And if we compare the share of the farms on GAO there is also a predominance of FF in both counties. In Slovenia FF prevail despite the fact that the production potential of traditional FF is limited (land, capital).

In summary we can say that in each country (except Slovakia) FF provide the largest share of agricultural output and this is just a confirmation of the statement that these farms are more productive, more efficient and probably produce higher incomes for rural families than CF.

Now we already know which farms in which countries are dominant and which have the largest share on GAO. But there is another indicator showing the performance of agriculture in CEECs and it is the structure and the competitiveness of agricultural

production. Agricultural production in some CEECs is concentrated on small FF (Poland), in other countries CF produce the largest share of GAO (Slovakia) and in some CEECs there is a mixed share of both types of farms on agricultural production (Belarus).

In general, countries usually specialize in production of commodities in which they have comparative advantage. One of the most widely quoted definitions, adopted by the EC is that a country has a comparative advantage in some product when it can produce this product at a lower opportunity cost than other countries. Comparative advantages are important for the existence of international trade. If they are open, countries trade with each other and they can get to commodities they cannot produce with their own technologies or in their own geographical conditions. We can imply this theory to our farm structures because FF and CF have also comparative advantages in the production of certain agricultural products. The share of FF and CF is important because the relative factor requirements in producing the same product are different between CF and FF. It means that both types of farms use different technology, different inputs and have different factor endowments.¹¹ According to many authors and according to Ricardian technology based theory of international trade, we can predict that large CF are more suitable for capital intensive production while FF are more efficient in production of labor intensive agricultural commodities and than, ceteris paribus, countries with prevailing CF are expected to produce and export more capital intensive goods and import relatively more labor intensive goods, and countries with predominance of FF specialize in production and export of labor intensive agricultural products and import products with relatively high capital content.¹²

Notes

⁵ **Lerman, Z., Cimpoiu D.** (2006), *Duality of Farm Structure in Transition Agriculture: The Case of Moldova*, Halle, IAMO, pp.105-119.

⁶ **Ciaian, P., Pokrivčák, J., Drábik, D.** (2007), *The Economics of Farm Organization in CEEC and FSU*, Hungary, Budapest.

⁷ **Small, L.-A.** (2005), *The Influence of „Family“ on Agrarian Structure: Revisiting the Family Farm Debate in Bulgaria and Southern Russia*, *Journal of Comparative Family Studies*, vol.36, pp.489-503.

⁸ **Ciaian, P., Swinnen, J.F.M.** (2006), *Land Market Imperfections and Agricultural Policy Impacts in the New EU Member States: A Partial Equilibrium Analysis*. *American Journal of Agricultural Economics*, vol.88 (Nov), pp.799-815.

⁹ **Csaki, C., Lerman, Z., Nucifora A., Blaas, G.** (2003), *The Agricultural Sector of Slovakia on the Eve of EU Accession*, *Eurasian Geography and Economics*, vol.44, No.4, pp.305-320.

¹⁰ **Lerman, Z., Sedik, D.J.** (2007), *Productivity and Efficiency of Corporate and Individual Farms in Ukraine*, Hebrew University of Jerusalem, Discussion Paper nr.7130.

¹¹ **Ciaian, P., d'Artis Kancs, Pokrivčák, J.** (2008), *Comparative Advantages, Transaction Costs and Factor Content of Agricultural Trade: Empirical Evidence from the CEE*, EERI Research Paper Series 2008.

¹² **Gorton, M., Davidova, S.** (2001), *The International Competitiveness of CEEC Agriculture*, *The World Economy*, vol.24 (Feb), pp.185-200.

Allen, D.W., Lueck, D. (2002), *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture*, Cambridge, MA, MIT Press.

4 LABOR FORCE AND TRANSACTION COSTS

Before we provide statistics on the labor force according to the farm structure we have to mention some basic indicators on agricultural employment in Table 4. The primary sector represents an important part of the economy in CEECs in terms of employment. The agricultural employment is ranging from 4% in the Czech Republic to 40,6% in Moldova. However, the importance of farming sector in CEECs is declining because between 2000 and 2005, its share diminished by 4,5 percentage points in terms of employment.

We have already mentioned that in CEECs dual structure of farms exists. According to this statement we also have to distinguish between family labor and non-family or hired labor. The total labor force, family labor force, non-family labor regularly employed and non regular non family labor force shows Table 5: Farm labor force for holdings of at least 1 ESU. We can express these data in persons or in Annual Work Unit. AWU is an equivalent to full-time employment. One AWU corresponds to the work performed by a person engaged in full-time agricultural work on the holding over a 12-month period.¹³

According to Table 5, the percentage of family labor force varies significantly across CEECs. For example, while Poland and Slovenia had the vast majority of their labor input in this labor category (each with over 90% of their total AWUs), the Czech Republic and Slovakia had much lower percentages (22 % and 20% respectively).¹³ As we explained in previous chapter it is because in Poland and Slovenia there is a large number of FF and these farms tend to use own family labor. On the other hand, in the Czech Republic and Slovakia CF using hired labor prevail and that is why over 70% of total labor force is represented by non-family labor. Gorton and Davidova claim that the quantity of hired or non-family labor depends on the balance between the gains from specialisation and monitoring costs.¹⁴ In Romania, Latvia and Lithuania family labor shares 86%, 78% and 76% respectively and in Estonia and Hungary family and non family labor is almost half by half.

Labor markets in all economies are subject to transaction costs associated with recruiting, monitoring and supervising workers. Transaction costs involve the costs of information, search, negotiation, screening, coordination and enforcement.¹⁵ Their level determines the extent to which family labor is advantageous over hired labor and thus the demand for labor. They are particularly important in agricultural labor markets, because in agriculture most work is not standardized and has many differences and peculiarities and it also requires personal judgements.¹⁶ Transaction costs typically arise due to information problems of two types: adverse selection and moral hazard.

Adverse selection means that the productivity of heterogeneous workers is not known with certainty, which leads to recruiting costs. It exists when attributes of workers are not easily observable. This is usually the problem of large CF using especially hired labor, because they have to invest into recruiting. On the other hand, small FF using only own labor provided by family members do not face adverse selection problems.

The second problem of labor markets that causes transaction costs is moral hazard. It occurs when work effort of employees is not completely observable, verifiable and enforceable, which leads to monitoring costs and supervision.¹⁷ The moral hazard problem shows up in the same way as the problem of adverse selection in farms, where the labor is hired. FF with only own labor do not suffer from this problem because family of the farmer is the residual claimant of income generated by farming.

The advantages of family labor do not stem only from the existence of transaction costs. We can mention many other strengths of family labor, but there are also some weaknesses. The main strengths of family labor are:

- the availability of family labor,
- lower labor costs (they do not have to pay social security, extra hours,...),
- family labor can adjust to changes in labor demand resulting from seasonal changes in production and by doing so, family labor overcomes the structural requirements for surplus production,
- the outcome of the production process is visible later than the effort itself and that is why employers have to rely on the reputation of the worker (this is facilitated when there are close family links).

On the other hand, weaknesses of family labor include:

- the emigration movement from rural areas toward cities,
- no space for adult children to earn an income, to make their own production and thus to be independent,
- family farming cannot any more be seen as a traditional way of living and family members may not be interested in farming which may result in a lack of family minded attitude to continue the family farm.¹⁸

4.1 Supervision

Whereas agricultural activities are usually carried out on large areas, the workers also cannot be gathered in a single location and be easily monitored. That is why we need to supervise them. Supervision is usually very costly, but the increase in productivity could outweigh the cost of it. This is more likely if the opportunity wage of an employer is low, if the cost of hired labor is high, and in environments with stronger legal institutions. Transaction costs in the form of supervision are increasing with rising farm sizes and numbers of hired workers. Thus, the demand for supervision depends upon some factors, among them for example: wages and the size of work groups.

The relationship between supervision and wages can be either negative or positive. The arguments in favor of negative correlation include efficiency wage models suggesting that supervision may be substituted by wage premiums when monitoring is costly.¹⁹ The arguments in favor of a positive relationship include: the compensating wage differential theory, the occupational differences and the substitution argument. The theory of compensating differentials argues that employees will tolerate high levels of supervision only if they are duly compensated for the inconvenience the supervision causes them. This theory was evolved from the claim that jobs differ in their attractiveness and wage differentials serve to compensate for the relative differences among jobs. For example, jobs involving hard physical labor, irregular employment or high level of supervision tend to be less attractive and companies must pay higher wages to workers.²⁰ The occupational differences argument says that some occupations lend themselves to high levels of shirking. Shirking is widespread among hired workers in FF and especially in CF. It is considered a very negative phenomenon and employers usually respond with even stronger supervision. Finally, the substitution argument exists if labor and supervision are substitutable in production. In that case a higher

relative wage of labor would lead the employer to substitute labor with more supervision, it means to supervise the existing labor more intensively.

According to many authors the demand for supervision depends also upon the size of work groups, which says that the supervision is more cost-efficient in larger work groups, but on the other hand, these are more difficult to supervise.¹⁷

Notes

¹³ **European Commission** (2009), *Agricultural statistics–Main results–2007-08*, Luxembourg, Office for Official Publication of the European Communities. Available on the Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ED-09-001/EN/KS-ED-09-001-EN.PDF, January 2010.

¹⁴ **Gorton, M., Davidova, S.** (2004), *Farm Productivity and Efficiency in the CEE Applicant Countries: a Synthesis of Results*, Agricultural Economics, vol.30.

¹⁵ **Sadoulet, E., de Janvry, A.** (1995), *Quantitative Development Policy Analysis*, Baltimore, Johns Hopkins University Press, p.397+xii, \$35.00.

¹⁶ **Kikuchi, M., Hayami, Y.** (1999), *Technology, Market, and Community in Contract Choice: Rice Harvesting in the Philippines*, Economic Development and Cultural Change, vol.47 (Jan), pp.371-386.

¹⁷ **DeSilva, S., Evenson, R.E., Kimhi, A.** (2000), *Labor Supervision and Transaction Costs: Evidence from Bicol Rice Farms*, Economic Growth Center, Yale University, Working Paper nr.814.

¹⁸ **Calus, M., Lauwers, L.** (2009), *Persistence of Family Farming, Learning from its Dynamics*, Canterbury, UK.

¹⁹ **Bulow, J.I., Summers L.H.** (1986), *A Theory of Dual Labor Markets with Application to Industrial Policy, Discrimination, and Keynesian Unemployment*, Journal of Labor Economics, vol.4, No.3 (July), pp.376-414.

²⁰ **Samuelson, P.A., Nordhaus, W.D.** (1995), *Economics*, 15th edition, Boston: Irwin/McGraw-Hill.

5 CONCLUSIONS

The main objective of this paper was the determination of farm size, production structure and demand for labor in agricultural markets of CEECs. We provided some statistical data on agriculture including the number of agricultural holdings, their share on total agricultural area and some data dealing with employment in agriculture. In addition, the

paper summarizes the role and the influence of transaction costs on farm organisation and demand for labor.

Drawing on the data provided by the European Commission in Farm Structure Survey we found that dual structure of farms exists in CEECs. There are large corporate farms and small family farms. Before the transition in 1990s, the dominant farm structure in most CEECs was corporate farms. But one of the main aims of agricultural reforms in these countries was to transform them into more productive and more efficient family farms. As we found out this goal was achieved in almost all CEECs.

Analysing the farm structure in CEECs we focused also on the share of corporate and family farms on gross agricultural output and on the competitiveness of agricultural production. Because many of these countries are member states of the EU they had to adapt to its Common Agricultural Policy. One of the main aims of CAP is to modernize this sector in all member states. Because in many western developed economies family farms dominate the agricultural sector the situation in CEECs also turned in favor of this type of farms and thus, present family farms have the largest share on gross agricultural output. In order to draw general conclusions about the competitiveness of each type of farm we have to say that different types of farms have different comparative advantages. These stem from the existence of transaction costs and from different inputs and technologies they use.

Finally, we provided some statistics on labor force in agriculture of CEECs. There are substantial variations in agricultural employment and the percentage of family and non-family labor force also varies significantly across CEECs. This is due to the different farm structures and due to transaction costs associated with recruiting, monitoring and supervising workers. We have to take all these indicators into account if we want to design the future performance of agriculture in CEECs.

REFERENCES

- ¹ **Allen, D.W., Lueck, D.** (2002), *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture*, Cambridge, MA, MIT Press.
- ² **Ciaian, P., d'Artis Kancs, Pokrivčák, J.** (2008), *Comparative Advantages, Transaction Costs and Factor Content of Agricultural Trade: Empirical Evidence from the CEE*, EERI Research Paper Series 2008.
- ³ **European Union** (2008), *Rural Development in the European Union. Statistical and Economic Information*. Directorate-General for Agriculture and Rural Development, Report 2008. Available on the Internet: http://ec.europa.eu/agriculture/agrista/rurdev2008/RD_Report_2008.pdf, January 2010.
- ⁴ **European Commission** (2009), *Agricultural statistics–Main results–2007-08*, Luxembourg, Office for Official Publication of the European Communities. Available on the Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ED-09-001/EN/KS-ED-09-001-EN.PDF, January 2010.
- ⁵ **Lerman, Z., Cimpoies D.** (2006), *Duality of Farm Structure in Transition Agriculture: The Case of Moldova*, Halle, IAMO, pp.105-119.
- ⁶ **Ciaian, P., Pokrivčák, J., Drábik, D.** (2007), *The Economics of Farm Organization in CEEC and FSU*, Hungary, Budapest.
- ⁷ **Small, L.-A.** (2005), *The Influence of „Family“ on Agrarian Structure: Revisiting the Family Farm Debate in Bulgaria and Southern Russia*, *Journal of Comparative Family Studies*, vol.36, pp.489-503.
- ⁸ **Ciaian, P., Swinnen, J.F.M.** (2006), *Land Market Imperfections and Agricultural Policy Impacts in the New EU Member States: A Partial Equilibrium Analysis*. *American Journal of Agricultural Economics*, vol.88 (Nov), pp.799-815.
- ⁹ **Csaki, C., Lerman, Z., Nucifora A., Blaas, G.** (2003), *The Agricultural Sector of Slovakia on the Eve of EU Accession*, *Eurasian Geography and Economics*, vol.44, No.4, pp.305-320.
- ¹⁰ **Lerman, Z., Sedik, D.J.** (2007), *Productivity and Efficiency of Corporate and Individual Farms in Ukraine*, Hebrew University of Jerusalem, Discussion Paper nr.7130.
- ¹¹ **Ciaian, P., d'Artis Kancs, Pokrivčák, J.** (2008), *Comparative Advantages, Transaction Costs and Factor Content of Agricultural Trade: Empirical Evidence from the CEE*, EERI Research Paper Series 2008.
- ¹² **Gorton, M., Davidova, S.** (2001), *The International Competitiveness of CEEC Agriculture*, *The World Economy*, vol.24 (Feb), pp.185-200.
- Allen, D.W., Lueck, D.** (2002), *The Nature of the Farm: Contracts, Risk, and Organization in Agriculture*, Cambridge, MA, MIT Press.
- ¹³ **European Commission** (2009), *Agricultural statistics–Main results–2007-08*, Luxembourg, Office for Official Publication of the European Communities. Available on the Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-ED-09-001/EN/KS-ED-09-001-EN.PDF, January 2010.
- ¹⁴ **Gorton, M., Davidova, S.** (2004), *Farm Productivity and Efficiency in the CEE Applicant Countries: a Synthesis of Results*, *Agricultural Economics*, vol.30.

- ¹⁵ **Sadoulet, E., de Janvry, A.** (1995), *Quantitative Development Policy Analysis*, Baltimore, Johns Hopkins University Press, p.397+xii, \$35.00.
- ¹⁶ **Kikuchi, M., Hayami, Y.** (1999), *Technology, Market, and Community in Contract Choice: Rice Harvesting in the Philippines*, Economic Development and Cultural Change, vol.47 (Jan), pp.371-386.
- ¹⁷ **DeSilva, S., Evenson, R.E., Kimhi, A.** (2000), *Labor Supervision and Transaction Costs: Evidence from Bicol Rice Farms*, Economic Growth Center, Yale University, Working Paper nr.814.
- ¹⁸ **Calus, M., Lauwers, L.** (2009), *Persistence of Family Farming, Learning from its Dynamics*, Canterbury, UK.
- ¹⁹ **Bulow, J.I., Summers L.H.** (1986), *A Theory of Dual Labor Markets with Application to Industrial Policy, Discrimination, and Keynesian Unemployment*, Journal of Labor Economics, vol.4, No.3 (July), pp.376-414.
- ²⁰ **Samuelson, P.A., Nordhaus, W.D.** (1995), *Economics*, 15th edition, Boston: Irwin/McGraw-Hill.

LIST OF ABBREVIATIONS

AWU – Annual Work Unit

CEECs – Central and Eastern European Countries

CF – Corporate Farms

EC – European Commission

ESU – European Size Unit

EU – European Union

FF – Family Farms

FSS – Farm Structure Survey

GAO – Gross Agricultural Output

TAA – Total Agricultural Area

UAA – Utilized Agricultural Area

Contact address

KATARÍNA SZEGÉNYOVÁ

Department of Economics.

Address: Tr. A. Hlinku 2, 949 76 Nitra, Slovakia

Phone number, e-mail: +421 904 997 577, kacena.szegenyova@post.sk

FRANTIŠEK KUZMA

Slovak University of Agriculture in Nitra, Slovakia. Faculty of Economics and Management.

Department of Economics.

e-mail: Frantisek.Kuzma@fem.uniag.sk

JÁN POKRIVČÁK

Slovak University of Agriculture in Nitra, Slovakia. Faculty of Economics and Management.

Department of Economics.

Phone number, e-mail: +421 905 947 056, jpokrivcak@yahoo.com

TABLES

Table 1: Main characteristics of agriculture for holdings of at least 1 ESU, 2007

	UAA (1000 ha)	Agricultural holdings in total (thsd)	Agricultural holdings of at least 1ESU (thsd)	Average area per holding (ha)
Czech Republic	3 489,7	39,4	25,9	134,6
Estonia	847,8	23,3	12,7	66,5
Hungary	4 054,2	626,3	141,0	28,8
Latvia	1 428,8	107,8	44,4	32,2
Lithuania	2 134,1	230,0	85,3	25,0
Poland	13 855,6	2 390,9	1 130,0	12,3
Romania	9 498,7	3 931,4	866,7	11,0
Slovakia	1 889,3	69,0	16,0	119,3
Slovenia	461,4	75,3	61,5	7,5

Source: Eurostat, Farm Structure Survey 2007.

Table 2: Farm structure, comparison between 1990s and 2004/2005

	Share of TAA before transition (%)				Share of TAA after transition (%)	
	Cooperative/ collective farms	State farms	Corporate farms	Family farms	Transformed cooperative farms	Family farms
Belarus	-	94	-	6	83	17
Bulgaria	58	29	-	13	55	45
Czech Republic	62	38	-	-	71	29
Estonia	57	37	-	6	44	56
Hungary	80	14	-	6	41	59
Latvia	54	41	-	5	10	90
Lithuania	-	91	-	9	12	88
Moldova	-	-	91	9	47	53
Poland	4	19	-	77	10	90
Romania	59	29	-	12	45	55
Slovakia	69	26	-	5	84	16
Slovenia	-	8	-	92	5	95
Ukraine	-	-	94	6	55	45

Source: EU, Agricultural Situation and Prospects in the Central and Eastern European Countries, 1998; Statistical Yearbooks of CEECs.

Table 3: Share of CF and FF on GAO, comparison between 1990s and 2004/2005

	Agricultural output before transition		Agricultural output after transition	
	Corporate farms (%)	Individual farms (%)	Corporate farms (%)	Individual farms (%)
Belarus	75	25	50	50
Estonia	47	53	-	-
Hungary	65	35	43	57
Latvia	72	28	24	76
Moldova	78	22	25	75
Poland	12	88	20	80
Romania	21	79	13	87
Slovakia	85	15	70	30
Slovenia	31	69	34	66
Ukraine	73	27	30	70

Source: EU, Agricultural Situation and Prospects in the Central and Eastern European Countries, 1998; Statistical Yearbooks of CEECs.

Table 4: Employment in agriculture, % of total employment

	1995	2000	2005
Bulgaria	23,9	26,2	8,9
Czech Republic	6,6	5,1	4,0
Estonia	10,2	7,2	5,3
Hungary	8,0	6,5	5,0
Latvia	17,3	14,5	12,1
Lithuania	23,8	18,7	14,0
Moldova	-	50,9	40,6
Poland	22,6	18,8	17,4
Romania	40,3	42,8	32,1
Slovakia	9,2	6,7	4,7
Slovenia	10,4	9,5	8,8
Ukraine	-	20,5	19,4
Average	-	18,9	14,4

Source: http://www.nationmaster.com/graph/lab_emp_in_agr_of_tot_emp-labor-employment-agriculture-total , January 2010.

Table 5: Farm labor force for holdings of at least 1 ESU, 2007

	Total labor force	Family labor force		Non-family labor regularly employed		Non regular non family labor force
		1000 persons	1000 AWU	1000 persons	1000 AWU	
Czech Republic	128,6	54,2	28,4	110,1	96,8	3,3
Estonia	25,2	28,7	12,8	14,0	11,7	0,7
Hungary	208,7	289,1	120,9	85,8	75,3	12,5
Latvia	70,0	93,4	54,9	18,6	14,4	0,7
Lithuania	111,2	191,2	84,4	28,1	23,9	2,9
Poland	1 738,4	2 770,1	1 622,7	59,9	52,6	63,2
Romania	965,5	1 870,0	829,1	62,1	47,6	88,9
Slovenia	75,0	167,0	69,2	3,0	2,5	3,3
Slovakia	63,5	33,9	12,9	54,6	46,8	3,8

Source: Eurostat, Farm Structure Survey 2007.