

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 and it was 0.19 €/m². It reached the level of 2001 with the value of 0.20 €/m² again 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

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.

$$\text{Net present value} = \frac{\sum \text{Cash incomes}}{(1+ir)^n} - \text{capital expense} \quad (1)$$

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

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 be 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 be 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 be much lower than it is in each County of Slovakia to reach minimal positive values.

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