IMPACTS OF DIRECT PAYMENTS ON INDICATORS OF AGRICULTURAL LAND MARKET IN HUNGARY

Sergey Vinogradov, Mária Fekete-Farkas, Zsuzsanna Tóth-Naár

Szent István University, Faculty of Economics and Social sciences, Institute of Economics, Law and Methodology, 2100 Gödöllő, Páter K. u. 1.

Abstract
This paper presents the results of modelling the impacts of increasing direct payments (SAPS) on market value and rental fees of arable land in case of Hungary. The authors found that 6-7 eurocents per additional euro of direct payments is capitalised in arable land rents.

Keywords: *direct payments, rental prices for arable land, stepwise regression model*

1. INTRODUCTION

The post-socialist transition in the 1990s and the shift to market economy has induced radical changes in Hungarian agriculture. The agricultural sector has been driven into more and more difficult situation. The production and ownership structure in agriculture has been substantially changed in the early 1990s. Prior to the post-socialist transition, production was performed mostly in state farms and cooperatives, complemented by the activities of subsistence farms. Large-scale farms (state-owned farms, cooperatives) cultivated the major share of arable land, while small-scale farmers (subsistence and subsidiary farms, private farmers) used the remaining area, closely connected to large-scale farms. Following the regime change, the implementation of laws concerning land use (compensation law, law about land rent and law about the conversion of cooperatives) has basically transformed the organisational structure of agriculture. Most of the large-scale farms were terminated, while some of them have tried to adapt to the new conditions by implementing reforms. Due to privatisation, the previously prosperous large-scale agricultural plants were replaced by mostly small-scale land owners. Major part of land had gone into private ownership and mostly not the owners cultivate the land. The changes in the early 1990s were the first steps in the separation of land ownership and land use. Following the land compensation, the land ownership has become extremely segmented. The newly created minor farms (small land, lack of capital and fixed assets, the available ones were worn out, disorganised production) were less suitable to meet market expectations.

The condition system regulating the Hungarian agricultural economy has been formed after the integration of Hungary into the European Union in May, 2004. Since the accession of Hungary to the EU, the agricultural sector has been regulated by the provisions of the Common Agricultural Policy (CAP). The reform targeting the development of production gives priority to the growing competitiveness of agriculture, but through the aid provided to producers - instead of encouraging production. It can be declared, that farming subsidies have considerable impact on land rent and land sale prices. Experts say (Latruffe et al. 2006, Duvivier et al. 2005, Ciaian and d'Artis Kancs 2012) that 15-34% of direct payments is built in land rent and – through them – in land prices, too.

The single area payment scheme can be requested for the areas determined by legal regulations, regardless of the utilisation of land. The beneficiary of subsidy is the legitimate user of the land. The source of subsidy is the fund as defined in the regulation of the EU Commission for the given grant year. By dividing this amount with the so-called SAPS area (base area), the maximum grant per hectare is received (this grant per hectare can be lowered by the value of payback rate). The degree of payment is determined by the regulation of the Ministry of Rural Development. The special feature and advantage of the system for the Hungarian farmers is that only some minimum area requirements should be met (1 hectare of arable land, 0.3 hectare of orchard:) and the farmer is entitled to use the subsidy from the union even without obligation to cultivate, only the condition system of „correct agricultural and environmental state" should be observed. It has resulted that the amount of subsidy

available at national level – the multiplication of base area defined during the accession negotiations and the annual financial budget – should be corrected by the size of areas which can actually be subsidised. Due to the interests of the EU and its financial capacity, the drawback of the system is that the implemented payment scheme starts from a low level (25%) and the amount gradually increases. (Vásáry and Osztrogonácz 2007)

The price of agricultural land increased by more than 11.6% in the 2013; the value of the nominal index reached 255.6 points from 100 in the base year (2000), and 229 in 2012 (Figure 1).

The land prices rose by 8.93% on average per year between 2000 and 2004 and following Hungary's accession to the EU in 2004, the pace of price rise went back to 6.85% per year.

The land rents increased at a faster rate than land prices. Land rent grew by 11.61% annually between 2001 and 2004, while the annual average rise was 11.21% after Hungary's accession to the EU. (Author's own calculation based on Swinnen and Vranken 2009, p. 42 and HSCO 2013, p. 5).

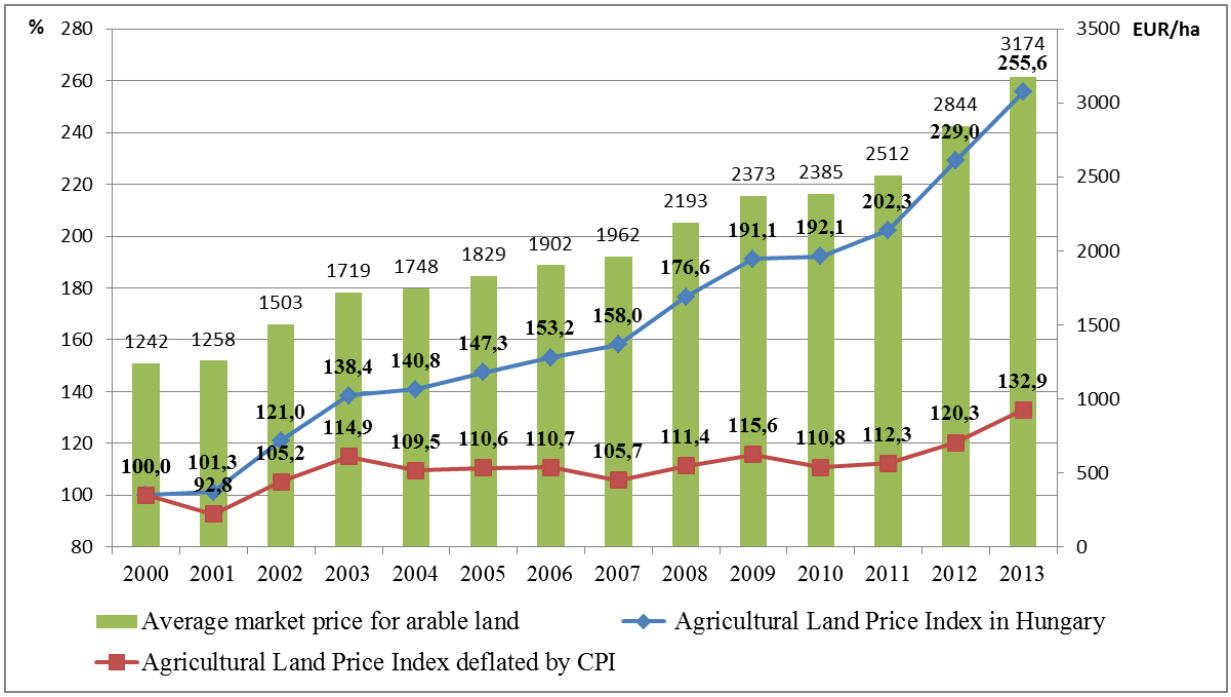


Figure 1. The evolution of Agricultural Land Price Index and average market price for arable land in Hungary. Source: FHB Index calculations, FHB Mortgage Bank Plc (2014).

The annual average market prices for arable land are calculated based on statistical data of FHB Mortgage Bank Plc.

The GTAP (Global Trade Analysis Project) model - examining the effects of integrating Central and Eastern European countries into the European Union - calculates with land prices that are higher by 170% when direct area-based subsidies are fully transfered then without these payments. By bringing closer the area-based subsidies to the EU level and also considering the permanently increasing demand for agricultural products, the rising farming revenues lead to the growth of land demand (rent and purchase) (Swinnen and Vranken 2003), thus the land trade is slowly expanding. About 120-130 thousand ha land is traded annually on the land market (without inheritance). The stimulation of land market, the increasing supply is inevitable for improving the efficiency of land use, which, in turn, will lead to growing prices. (Biró 2009)

Ciaian and Kancs (2012) says that one EUR of Direct Payments increases land rent by 0.19 EUR on average in case of EU member states. As regards the land price, it is estimated that the land value

increases the land rent by 0.19 EUR in regard to the new member states of EU-15. If the land value/price is defined as the capitalised value of land rent according to the estimated value. In respect to the value/price of land if it is presumed that the value/price of land is the capitalised value of land rent, the land price would increase by 2000 EUR compared to 2003. By providing less subsidy to the producers – compared to EU-15 – the land price declined by 1409 EUR. This tendency is described by Figure 2.

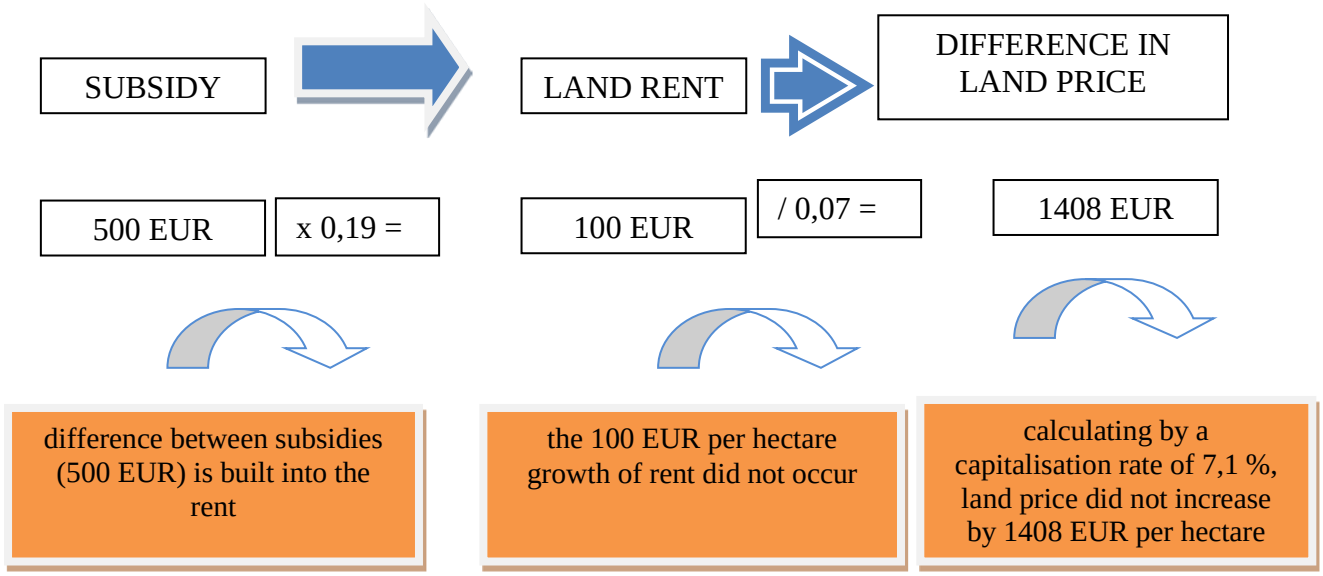


Figure 2. The estimated affect of increasing direct payments on land value

Source: own edition, based on Ciaian and d'Artis Kancs (2012)

In order to stimulate the land trade by 5%, in addition to the 12.7 thousand farms with long-term liabilities using 462.3 thousand hectare own land, further 10-15 thousand private farms with 150-200 thousand hectare own land should be involved in money lending (Biró 2009).

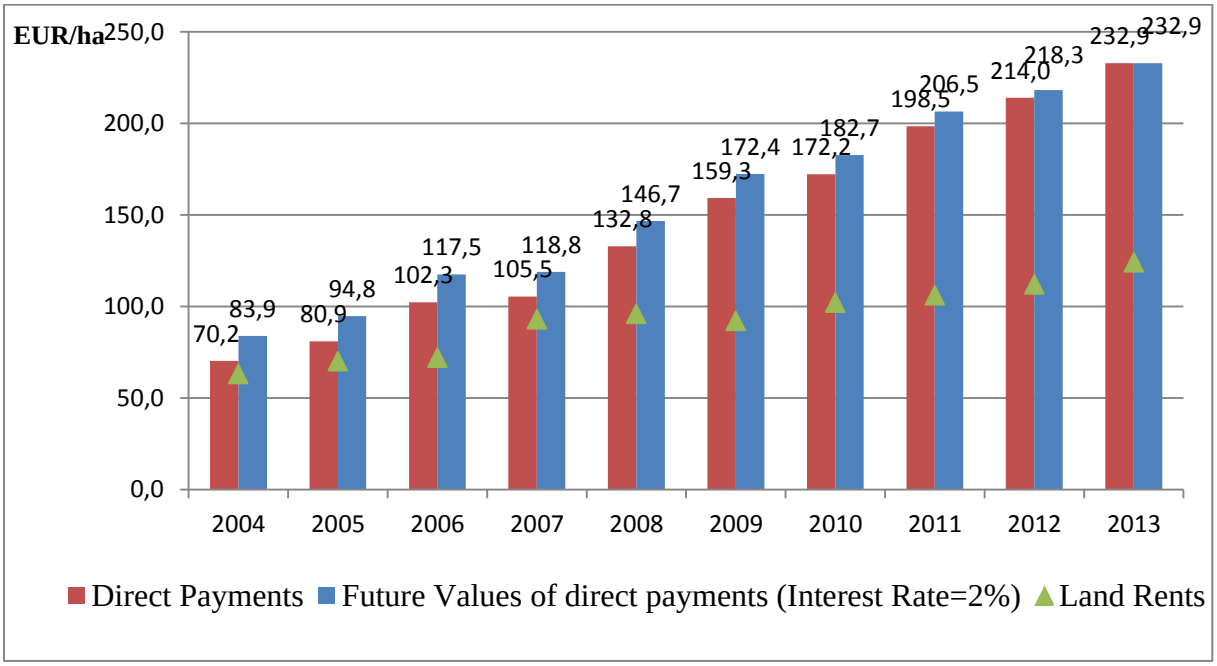


Figure 3. Direct payments (included national payments) in Hungary per hectare between 2004 and 2013, €. Source: own edition based on regulations of Ministry of Rural Development, Hungary

The cumulated future value of direct subsidies during 2004-2013 is 1574 EUR. According to the estimations made by experts (Ciaian and Kancs 2012, Van Herck and Vranken 2013), the area-based direct payments would have capitalising in land rental prices in 15-32%, the SAPS system would have increasing the land rents per hectare cumulatively by 240-500 EUR on average in respect to Hungary, following the accession to the EU. However, in reality, the rental rates have increased cumulatively by around 300 euro per hectare on average over the examined period.

2. MATERIALS AND METHODS

The aim of this empirical study was to give quantitative evaluation about the capitalisation of direct payments in rental prices of arable land in Hungary.

The data required for the research were provided by the Entreprise Analysis Department (operator of Test Farm System – FADN) of Agri-Business Research Institute (AKI). Although not only COP crops, but all the crops - including fodder crops and grassland - belong to the group of subsidised crops according to SAPS, considering the aim of the present research only the enterprises dealing exclusively with field crop production were analysed. More precisely, those enterprises were put under scrutiny in case of which the revenues from field crop production amounted to more than 90% of the gross value of production. In respect to farms participating in test farm system, only those field crop producing enterprises were selected which applied for direct payments during the period from 2004 till 2009.

It is important to note that the payment per hectare can be different in case of the examined enterprises because the size of area for which the subsidy was requested was not known, thus the total agricultural area of the farm - which usually meant the arable land in case of field crop farms - was regarded as a base when the payment per hectare was determined.

The data processing and statistical analyses were made with the help of IBM SPSS Statistics 21.0 for Windows statistical software package.

We used stepwise multiple regression analysis to determine the impact of increasing direct payments on land rents.

To econometrically quantify the effect of direct payments on land rents, we estimate the following model (Equation 1.):

$$Rent_{i,t} = a + b_1 DP_{i,t} + b_2 DP\%_{i,t} + b_3 ESU_{i,t} + \sum_{j=1}^{7} Region_{i,t}^{(j)} + \sum_{k=1}^{6} b_{k+10}\, Year_{i,t}^{(k)} + \varepsilon_{i,t} \qquad (1)$$

where:

$Rent_{i,t}$ = the rental price of arable land in case of the *i*-th farm in year *t*;

a = the regression constant;

$b_1, b_2, \cdots b_{16}$ = the unstandardized regression coefficients;

$DP_{i,t}$ = the value of direct payments per ha expressed in euros in case of the *i*-th farm in year *t*;

$DP\%_{i,t}$ = the share of direct payments in the gross farm income in case of the *i*-th farm in year *t*, *%*;

$ESU_{i,j}$ = economic size of the *i*-th farm in year *t*, in the *European Size Unit*;

$Region_{i,t}^{(j)}$ = dichotomous variable, it is coded as 0 and 1: Does the *i*-th farm in year *t* belong to the *j*-th region? Yes (1) or Not (0)? Where *j*=1,2, ⋯,7.

If *j*=1, then the Region$^{(1)}$= Central Hungary;

if *j*=2, then the Region$^{(2)}$= Central Transdanubia;

if *j*=3, then the Region$^{(3)}$= West Transdanubia;

if *j*=4, then the Region$^{(4)}$= South Transdanubia;

if *j*=5, then the Region$^{(5)}$= North Hungary;

if *j*=6, then the Region$^{(6)}$= Northern Great Plain;

if *j*=7, then the Region$^{(7)}$=Southern Great Plain.

$Year_{i,t}^{(k)}$ = dichotomous variable, it is coded as 0 and 1: Does the data for *i*-th case refer to the year *k*? Yes (1) or Not (0)? Where *k*=1,2, ⋯,6.

If *k*=1, then the Year$^{(1)}$= 2004;

if *k*=2, then the Year$^{(2)}$= 2005;

if *k*=3, then the Year$^{(3)}$= 2006;

if *k*=4, then the Year$^{(4)}$= 2007;

if *k*=5, then the Year$^{(5)}$= 2008;

if *k*=6, then the Year$^{(6)}$= 2009;

$\varepsilon_{i,t}$ = error term.

3. RESULTS

The final stepwise model included 8 variables, two of which – the value of direct payments per ha and the the share of direct payments in the gross farm income – are main variables of interest (Table 1.).

Table 1. Estimation results for Linear Regression Model

Explanatory variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	88,537	6,126		14,453	0,000
Region(4)	41,778	3,669	0,379	11,386	0,000
Region(7)	38,458	3,939	0,317	9,764	0,000
DP%	-1,266	0,158	-0,266	-8,007	0,000
Year(1)	-17,91	3,967	-0,148	-4,515	0,000
Region(6)	11,794	3,164	0,122	3,727	0,000
DP	0,064	0,030	0,075	2,147	0,032
Year(2)	-9,853	3,825	-0,080	-2,576	0,010
Year(3)	-9,241	3,686	-0,079	-2,507	0,012

n=819, R^2=0,289, p<0,01

Source: authors' calculations based on the constructed sample

The European size unit (ESU) of the farm was not proven to be a significant factor in respect to the rents. As regards the other two principal explanatory variables, the impact of the share of DM in total product value was the strongest (Beta=-0.266). In case of those enterprises where the direct subsidies had higher than 1%-point share in gross value of production, the rents are lower by 1.27 euro on average. Direct payments (DP) are found to have a weak (the value of the partial correlation coefficient is 0.075) but statistically significant (p=0.032) positive impact on land rents. By examining the average of cases it can be concluded that an increase of one additional euro per ha in direct payments increases land rents by 6.4 eurocents.

Van Herck and Vranken (2013) found that up to 25 eurocents per additional euro of direct payments is capitalised in land rents in six new EU member states ,while capitalisation of direct payments is lower in countries where more land is used by corporate farms. For example in Hungary 48.19 percent of arable land cultivated by corporate farms. The number of corporate farms is only 2.2 percent of the number of all agricultural enterprises. Average land use of arable land at private farms was 7.1 ha, corporate farms cultivated 305 hectares on average in the 2013. Concentration of land use in Hungary is significant, altogether 14 thousand farms (3.1%) cultivates more than 74% of total land (author's own calculation, based on the FSS 2013).

The land rents in the Northern Great Plain, Southern Great Plain and South Transdanubia regions are higher, respectively, by 11.79, 38.46 and 41.78 euro on average compared to other regions.

In the year of Hungary's EU accession (2004) the average land rental price was lower by 17.91 euro per ha. In the 2005 and 2006 model years the average rental price was lower, respectively, by 9.85 and 9.24 euro per ha compared to other examined years.

4. CONCLUSION

The results of empirical research made among enterprises dealing with field crop production lead to the conclusion that the impact of increasing direct payments on arable land rent can be confirmed statistically. But the weak linear relation between the direct area-based payments and the land rent refers to the fact that the land-based subsidies are not built in the land rent fees directly, but they increase the yield of production factors – including land – through the improvement of profitability of

field crop production. According to references, it is due to the fact that most of the contracts stipulate amounts per golden crown based on wheat prices, or fees per hectare in euro, or fix annual rise by 2-3 thousand HUF (≈7-10 Euro). Thus the direct payments have no impact on these rural lease contracts. The EU payments result higher fees only in those cases when the agricultural lease is connected directly to the payments. However, only relatively few contracting parties lay down payment conditions on the basis of subsidies.

The EU payments do not have direct impact on the land prices in Hungary, either. These are basically affected by demand and supply conditions.

REFERENCES

1. Bastiene N., Saulys V. 2005, The problems of drained land evaluation. In: *Proceedings of the second scientific international conference RURAL DEVELOPMENT 2005*. 17-19. November, 2005. (In: Rural landscape management). Kaunas r., Lithuania: Lithuanian University of agriculture 2005; 147-149.
2. Biró SZ. 2009, The institution of agricultural mortgage credit and its application potential in the Hungarian Agriculture (In Hungarian). A földjelzálog-hitelezés intézményrendszere és alkalmazási lehetőségei a magyar mezőgazdaságban. Gödöllő: Szent István Egyetem, doktori értekezés. 2009, 97-98.
3. Ciaian, P. & d'Artis Kancs 2012, The Capitalization of Area Payments into Farmland Rents: Micro Evidence from the New EU Member States. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*. vol. 4, no. 60, 517-540. p.
4. Duvivier, R, Gaspart, F&Henry de Frahan, B 2005, A Panel Data analysis of the Determinates of Farmland Price: An Application to the Effects of the 1992 CAP Reform in Belgium. XI-th European Association of Agricultural Economists Congress, Copenhagen, Denmark, 23-27 August.
5. European Union Directorate-General for Agriculture and Rural Development. Agriculture in the European Union. Statistical and economic information, 2008; Available online: http://ec.europa.eu/agriculture/agrista/2008/table_en/2008enfinal.pdf (accessed on 9 March 2010).
6. Farm structure survey (FSS) 2013, Hungarian Central Statistical Office (HSCO), Budapest
7. Hungarian Central Statistical Office (HSCO) 2013, Sales and rental prices for agricultural land in Hungary (in Hungarian), p. 10.
8. Swinnen, J. F. M. &Vranken, L 2003, Land Rental Markets and Household Farms in Transition: Theory and Evidence from Hungary, LICOS Centre for Transition Economics, Katholieke Univrsiteit, Leuven, Discussion Paper 129/2003, p.35.
9. Van Herck, K &Vranken, L 2013, 'Direct Payments and Land Rents Evidence from New Member States', Factor markets, no. 62, pp. 22. viewed 30 May 2014, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2329931
10. Vásáry, M & Osztrogonácz, I 2007, The vision of domestic support system (in Hungarian)A hazai támogatási rendszer jövőképe, AVA-3 International Conference on Agricultural Economics, Rural Development and Informatics, Debrecen, 11 p. viewed 7 May 2014, <http://www.avacongress.net/ava2007/presentations/aks1/8.pdf>