

Direct payments and rent extraction by land owners: Evidence from New Member States

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1. INTRODUCTION

In 2004, eight Central and Eastern European countries joined the European Union (EU). This accession round was followed by the accession of Bulgaria and Romania to the EU in 2007. Since EU accession, farm support in the EU New Member States (NMS) is implemented through the Common Agricultural Policy (CAP) and in most countries financial support to farmers largely increased compared to the pre-accession level.

A general purpose of agricultural subsidies in the EU is to increase farmers' incomes "to ensure a fair standard of living for the agricultural Community". However, in addition to this first order effect, agricultural subsidies also induce second-order adjustments. Various studies have analysed the second-order effects of agricultural policy measures (see e.g. Hertel, 1989; Salhofer, 1996; Dewbre *et al.*, 2001; Alston and James, 2002; Guyomard *et al.*, 2004; Ciaian and Swinnen, 2006, 2009). In general, these studies find that agricultural subsidies alter farmer production incentives and thus factor demand. One strand of the literature considers the second order effects of policy impact on the land market (among others, Floyd, 1965; Guyomard *et al.*, 2004; Ciaian and Swinnen, 2006, 2009).

In case that agricultural policy affects rural land markets, there are two important implications.

First, rent extraction by land owners reduces the impact of subsidies on agricultural income. If land owners are farmers, the impact of rent extraction on agricultural income is rather limited. However, in several NMS land reforms restituted land rights to the former owners who are no longer active in agricultural sector. As a result, a large share of the utilized agricultural area (UAA) is rented out by these absentee land owners, often to large scale cooperate farms (Table 1).

Second, an increase of land rents has a direct negative effect on land mobility and an indirect negative effect on structural change. New farmers face a higher initial investment cost and existing farmers face a higher cost of expansion. Consequently, the transfer of land from less to more efficient users will be reduced which has a negative impact on structural adjustments that are necessary to increase the competitiveness of the sector.

Table 1: Share of utilized agricultural area used by legal entities and rented out

Country	Percentage of UAA used by legal entities (%)	Percentage of UAA rented (%)
Bulgaria	53%	79%
Czech Republic	71%	83%
Estonia	48%	50%
Latvia	9%	27%
Lithuania	14%	48%
Hungary	52%	56%
Poland	10%	20%
Romania	35%	17%
Slovakia	80%	89%

Source: Eurostat

In this paper, we estimate the impact of direct payments on land rents in selected NMS. Virtually all existing empirical studies have dealt with data on the land market in North America (the US and Canada). To our knowledge, there are few studies that have empirically analysed the impact of direct payments on land rents in the EU (Patton *et al.*, 2008; Killian *et al.*, 2008; Ciaian and Kancs, 2009; Ciaian *et al.*, 2010). We present the empirical evidence of a natural experiment being the accession of several countries to the EU where as a result of accession CAP measures have been introduced. This resulted in a considerable change in the level of subsidies paid in most NMS. To our knowledge there is only one study that analyze the impact of direct payments in the NMS: Ciaian and Kancs (2009) investigate the impact of the Single Area Payment Scheme (SAPS) in the NMS based on farm level panel data of the period 2004-2005. However, to our knowledge no study has attempted to consider also the pre-accession period when most NMS already started to provide agricultural support to their farmers.

In the next section, we briefly discuss rental land market and direct payments in the NMS. The third section gives an overview of the exiting literature on the impact of agricultural policy land rents. In section 4 we empirically test the impact of direct payments on land rents in selected NMS. Finally, we conclude and discuss policy implications.

2. RENTAL LAND MARKETS AND DIRECT PAYMENTS IN NMS

In this section we briefly discuss rural land markets and agricultural policy in the NMS before and after the accession to the EU.

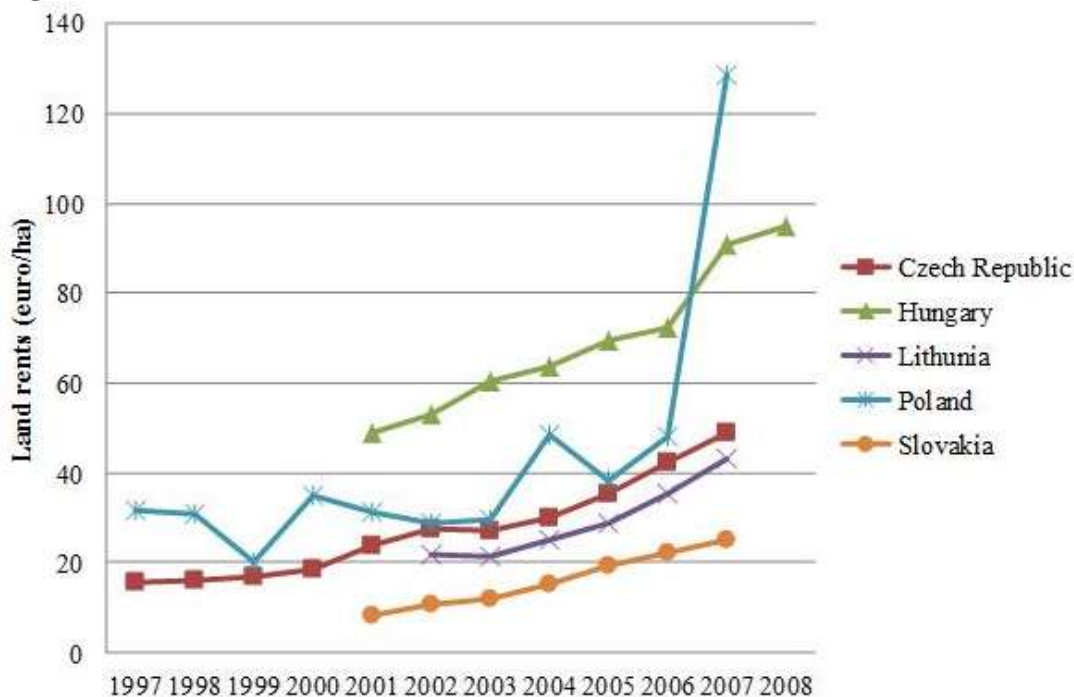
2.1. Rental land markets

Similar to US and several EU15-countries, most of the land transactions in the NMS take place through the rental market, although there are large variations among countries (Table 1). In Slovakia and the Czech Republic, more than 80% of the cultivated land area is rented. Also in Bulgaria, land renting is very prominent (79% of total land). In Hungary, Estonia and Lithuania, between 48% and 56% of the cultivated area is rented. In Latvia, Poland and Romania, the figures fall to respectively 27%, 20% and 17%.

There is a striking correlation between the prevalence of land rental at the country level and the proportion of corporate farms in total land use (Swinnen *et al.*, 2006). While corporate farms own little land, they use a lot of land in some countries, almost all of which is rented. In the Czech Republic and Slovakia, more than 70% of the total agricultural land area is used by corporate farms (Table 1). Also in Hungary, Estonia and Bulgaria, corporate farms still use around half of all agricultural land. The presence of high transaction costs reduces the incentives for landowners to withdraw their land and reallocate it. Therefore a large share of agricultural land is still rented to the organisations that have taken over the former cooperatives and state farms (Vranken *et al.*, 2011).

In the period 2000-2008, land rental prices increased significantly in the NMS and the increase was especially strong around the period of EU accession. For example, if one compares rental prices from just before (2003) to just after accession (2006), real land rental prices grew substantially in the Czech Republic, Lithuania, Hungary, Poland and Slovakia (Figure 1).

Figure 1: Evolution of land rents in selected NMS (in euros)



*Price data are real prices (in 2010 prices)

**Data for Poland in 2007 are excluded from the regression as this could be considered as an outlier (land rents were exceptionally high as these were partially based on the cereal prices which were exceptionally high in 2007)

Source: Own calculations based on the constructed dataset

Land rental payments in the NMS are usually in cash, although in several NMS at least a part of the payment is in kind. For example, in Poland, more than 20% of the contracts involving private rentals in 2005 were in kind (goods and services) rather than in cash. Land rents are generally paid at the end of the season (after the harvest) and depend on the weather or market conditions. In case of unfavourable conditions, payments are reduced or not paid at all (Swinnen and Vranken, 2009). This particular feature of the rental market in NMS will allow us to use contemporaneous values of the explanatory variables instead of expectations.

2.2. Agricultural policy

After the transition to a more market orientated economy, agricultural support dramatically reduced in all Central and Eastern European countries. However, when the economic and institutional climate started to improve at the end of the 1990s, agricultural support started to increase again. Later, when the countries accessed the EU agricultural support increased even further.

There are several distinct types of support measures. First, governments can make payments directly to producers, so-called “direct payments”. Before EU accession, agricultural policy in the selected NMS, included a wide variety of direct payments. For example, in Poland there were output payments for crop production such as bread cereals (payment/tonne) and in the Czech Republic and Slovakia there were payments for livestock production such as for sheep, beef or milk production (payment per head or per litre). In addition, there existed in all countries area payments, which are

payments based on the cultivated area (payment/ha). For example for flax in the Czech Republic or for arable land in Slovakia.

After EU accession, there were two main types of direct payments depending on the source of the subsidy. First, there is the Single Area Payment Scheme (SAPS), which is financed by the EU budget. SAPS payments are fixed payments per ha, which are decoupled from production and, in principle, uniform for all eligible land within each NMS.¹ SAPS payments are gradually implemented and they will reach the EU-15 level in 2013. Second, the NMS were allowed to supplement the SAPS payments by national “top-up” payments (or Complementary National Direct Payments (CNDPs)). These “top-up” payments could be implemented in a similar way as SAPS, namely as a fixed payment per ha. However, the NMS could also decide to couple the support to production.²

3. OVERVIEW OF THE EXISTING LITERATURE

Various studies have analysed the impact on land markets of agricultural policy measures that have been implemented to support farmers’ income in developed countries (e.g. Floyd 1956; Ciaian and Swinnen 2006, 2009; Goodwin and Ortalo-Magné 2002; Lence and Mishra 2003; Kirwan 2005). These studies have indicated that there is rent extraction of land owners. Although the effect depends on the type of subsidy. The next sections present an overview of the theoretical findings and empirical evidence of the impact of coupled direct payments on the income distribution between the farmer and the owner of the input factors.

3.1. Theoretical evidence of capitalization of government payments

Ciaian *et al.* (2010) analyse the impact of different forms of coupled direct payments on land markets. They develop a partial equilibrium model, which combines two inputs (land and a non-land input) in a production function of one agricultural output.³

According to Ciaian’s model, output payments increases the price of a factor if the supply elasticity of that factor is not perfectly elastic. A given percentage increase in product price will result in the same percentage rise in all factor prices if inputs are perfect substitutes in production or if the supply elasticities of the two factors are the same. If the factor supply elasticities are not equal, the price of the input with the least

¹ However, there are substantial differences between the NMS. These variations stem from the fact that the level of per hectare payments is computed by dividing the available EU financial “envelope” for each country by the eligible agricultural area. The EU rules for the determination CAP Pillar I financial allocations imply that higher land productivity results in higher hectare payments, as historical yield levels (2000-2002) were factored into the determination of the financial envelope for Pillar I. There was a large variety in the reference yield of the different NMS which results in a disparity in the direct payments.

² In addition to direct payments, governments can also use specific instruments, such as quota, tariffs and intervention buying to support farmers’ income. These instruments create a gap between the domestic producer price and the world market price of a specific agricultural commodity and are referred to as market price support (MPS). Already before EU accession, the NMS implemented quota, tariffs and intervention buying, to protect their agricultural markets. After EU accession, market price support was implemented in the same way as in the EU15. In this paper, we will not analyse the impact of MPS because after EU accession MPS is in theory the same for all farmers as within the EU they face the same domestic prices for all products.

³ They based their model on the model of Floyd (1965), who analyzes the effects farm price supports on the returns to land in agriculture.

elastic supply will increase more. Hence, the impact of output payments on land rents depends largely upon the factor supply and substitution elasticities. In fact, in case the factor supply is entirely inelastic and the elasticity of substitution between factors is zero or the factor proportions are fixed, the output payment will be fully capitalized in the price of the factor with inelastic supply. If this factor is land, then the output payment will be fully capitalized in land rents.

Area payments, which are targeted on land, stimulate farm land demand and in combination with inelastic land supply, these payments are capitalised into higher land rents, creating leakages of policy rents to landowners. In a corner solution, when the land supply is fixed, the land subsidy is fully capitalised into land rents.

In summary, in case land is the most inelastic production factor, both output and area payments are expected to be capitalized in land rents and the price of land will increase relative to the price of the other inputs. In case the land supply elasticity is equal to zero (or land supply is fixed) area payments will be fully capitalized in land rents. Output payments are fully capitalized in land rents if, additionally to zero land supply elasticity, either the supply elasticity of non-land inputs is perfectly elastic or if factor proportions are fixed.

In addition to the type of subsidy, the capitalization of subsidies also depends upon the exact policy implementation, market imperfections, and land market institutions and regulations.

First, if subsidies are only implemented for a limited period of time, they may not be capitalized in the land value. Also the criteria determining the eligibility to receive the future stream of policy transfers, may limit the capitalisation of subsidies (Sumner and Wolf 1996; Ciaian and Swinnen 2006, 2009; Kilian and Salhofer 2008). For example, area payments may be subject to cross-compliance, set-aside, or other requirements. If area payments are subject to cross-compliance, then their effect on land rents is (partially) mitigated due to the fact that farmers have to incur certain costs in order to meet the eligibility criteria.

Second, also land market institutions and regulations may affect capitalization of payment in land rental rents. The most obvious case regulation affecting the land market is the case where rental payments are regulated by the government such as it is for example the case in Belgium or France (Ciaian *et al.* 2010).

Finally, market imperfections affect the capitalization of government payments (see for example, Chau and de Gorter 2005; Hennessy 1998). At the end of 1990s, market imperfections in the credit markets (including credit and technology) and output markets were major limitations on the functioning of land markets in the NMS. At the end of the 1990s and especially in the beginning of the 2000s, under the impulse of the prospect of EU accession and economic growth, market imperfections started to decrease. This resulted in increased investments in agriculture and in an increase in farm productivity which in turn leads to a rise in the demand for land in the NMS. Furthermore, foreign and domestic investment in the food industry and agribusiness were stimulated with major positive vertical spillovers on farms. Ciaian and Swinnen (2009) analyse the impact of credit market constraints on capitalization of area payments in land rents and they find that in theory area payments increased land rents by more than the payment.

3.2. Empirical evidence of capitalization of government payments on land rental markets

There is less evidence on the capitalization of government payments in land rents than on the capitalization in land values. Although, Whithaker (2006) argues that investigating the effects of domestic support on land rents is more relevant for at least two reasons. First, rental rates are observed in the market while land value is often stated by the owner and therefore subjective. Second, rental rates are less affected by urban and other non-agricultural pressures as contracts have only a limited duration.

Almost all available studies on the capitalization of land rent use US data, but recently the number of studies analysing the impact of CAP payments on land rents increased.

Using US-county level data from the state Iowa, Lence and Mishra (2003) examine the impact of government payments on cash rents using county-level panel data for 1996-2000. Unlike most other studies on land values and rents, Lence and Mishra control for spatial autocorrelation and they find an increase in land rents of \$0.13 per acre for each additional dollar of government payments.

Roberts et al. (2003) use 1992 and 1997 farm-level panel data from the US Census of Agriculture. They find that an increase in cash land rents of between \$0.34 and \$0.41 per acre for each additional dollar of government payments. Using the same data, Kirwan (2005) finds in a related study that landowners capture on average between \$0.20 and \$0.40 of the marginal per acre subsidy dollar depending on the region and farm size.

Using EU data, Patton et al. (2008) analyse the impact of both coupled and decoupled direct payments on land rents in Northern Ireland covering the period 1994 to 2002. They find that the impact of CAP direct payments on rental values depends on the type of payment and on the nature of the production characteristics of the associated agricultural commodity.

Also in the EU, Kilian et al. (2008) analyses capitalization of direct payments in land rental prices in 2005 in Bavaria (region in Germany). They find that 1 additional euro of direct payments increases rental prices by 28 to 78 cents. Additionally, they evaluate the effect of decoupling support and they find an increase in the capitalization ratio due to decoupling as additional 15 to 19 cents are capitalized into land rents.

Ciaian and Kancs (2009) investigate the impact of the Single Area Payment Scheme (SAPS) in the NMS based on farm level panel data of the period 2004-2005. They find that almost 20% of the SAPS payment is capitalized in land rents. However, in a related study, Ciaian et al. (2010) analyse the income distributional effects of the common agricultural policy for farmers and landowners, using a farm level panel data for the period 1995-2007 in selected member states. Their results do not confirm the theoretical hypothesis that landowners benefit a large share of the CAP subsidies. According to their estimates, farmers gain between 60% to 95%, 80% to 178% and 86% to 90% of the total value of coupled crop/animal, coupled RDP and decoupled payments, respectively. They find that CAP subsidies are only marginally capitalised in land rents, although the effects depend on the type of payment.

4. ECONOMETRIC ANALYSIS

4.1. Model and variables

To econometrically quantify the effect of direct payments on land rents, we estimate the following model:

$$RENTS_{it} = a_0 + a_1 MKR_{i,t} + a_2 DP_{i,t} + a_3 EBRD_{i,t} + \alpha_4 IP_{i,t} + \delta_i + \varepsilon_{i,t} \quad (1)$$

where $RENTS_{it}$ represent the average rental price of agricultural land in country i in year t . $RENTS_{i,t}$, is defined as respectively the deflated country average land rental price in euros⁴. Land rents are obtained from national statistics cited in Swinnen and Vranken (2009).

To clarify to our choice of the dependent variables in the empirical model, we start from the assumption of a perfect market for agricultural land.

In a perfect market, marginal cost equals marginal return and hence we expect the land rental price per hectare to equal the market return of agricultural production per hectare. In order to estimate the effect of market return on land rents, we include $MKR_{i,t}$. $MKR_{i,t}$ is the deflated agricultural output per hectare, expressed in euros. We expect a positive correlation between land rents and market return.

However, markets are not perfect and there are several factors, which may create distortions.

First, all countries provided direct payments to the farmers. $DP_{i,t}$ is the average deflated amount of direct payments per ha expressed in euros. Due to data limitations, we aggregated output and area payments, although it is possible that the effect will be different depending on the type of the subsidy.⁵ Before EU accession, the coupled payments ($DP_{i,t}$) are calculated as the sum of the OECD support categories “Payments based on output” and “Payments based on area planted/ number of animals” divided by the total utilized agricultural area as obtained from Eurostat. After EU accession, $DP_{i,t}$ is the sum of SAPS payments and national “top up” payments, divided by the total utilized agricultural area as obtained from Eurostat. Given the theoretical evidence of the capitalisation of direct payments (see above), we expect a positive coefficient of the $DP_{i,t}$ variable.

Second, besides subsidies, there are still market distortions in the NMS related to the transition process which started in 1989, but still continues in most countries. In order to control for the progress in the reform process, we include the EBRD transition indicator. This variable ($EBRD_{i,t}$) rates the progress of a country’s reforms in several areas.⁶ The effect of this $EBRD_{i,t}$ is expected to be mixed. First, in case of poor functioning land markets, we expect that the rental prices of agricultural land to be higher as rural households are reluctant to rent out land, which reduces the supply of agricultural land. This may result in a negative correlation between $EBRD_{i,t}$ and land rents. Second, improvements in other markets, such as the credit market, may result in a

⁴ All monetary values are collected in national currency, converted to Euros and deflated using the average annual exchange rate and the GDP deflator for the EU, which are obtained from Eurostat.

⁵ Based on the theoretical insights presented in section 3, we expect that area payments will be more capitalized into land rents than output payments.

⁶ The EBRD transition indicator gives a score from 1 to 4. It aggregates assessments of the privatization of small- and large scale enterprises, enterprise restructuring, price liberalization, trade and foreign exchange system liberalization, competition policy, bank and nonbank financial sector reforms. economies. The general EBRD indicator is the average of the score given to the reforms in each area. A high value of the general indicator is associated with a higher level of reform and hence better working institutions.

higher demand for land and therefore we may expect a positive correlation between $EBRD_{i,t}$ and land rents.

Third, we include $IP_{i,t}$, which is the agricultural input price index on the national level. The index includes price data on two important substitutes for land, namely fertilizer and fodder. Data are obtained from Eurostat. Most empirical research on land rents fails to control for the input costs of substitutes for agricultural land. However, theoretically, in case the elasticity between substitutes for land is not zero, this affects the level of capitalization of the coupled direct payments (see section 3.1). An increase in this index is expected to have a positive impact on land rents.

Finally, we also include country fixed effects (δ_i) in order to control for unobserved heterogeneity that remains fixed over time. Since both coupled and decoupled direct payments are based on regional productivity, direct payments are exogenous within the country, but endogenous between the different NMS.⁷ In this case, controlling for country fixed effects should eliminate the endogeneity bias as in a fixed effects estimation we allow the unobserved fixed effect to be correlated with the included variables.

Note that for the dependent variables we use contemporary values rather than expected values. This is possible because in the NMS rental payments are generally paid at the end of the season and can depend on the weather and market conditions (Swinnen and Vranken, 2009).

Table 2 gives an overview of the data used in respectively the land rents regression and the land values regression.

Table 2: Description of the variables in the land rents regression

Variable	Definition	Mean	Standard deviation
Dependent variable			
RENTS	Deflated average land rents (€/ha)	34.02	17.92
Main variable of interest			
DP	Deflated direct payments per ha (€/ha)	69.27	55.36
Control variables			
MKT	Deflated market return (€/ ha)	743.59	360.78
EBRD	EBRD transition indicator (score 1 to 4)	3.50	0.29
IP	Agricultural input price index (100=2007)	83.67	9.36

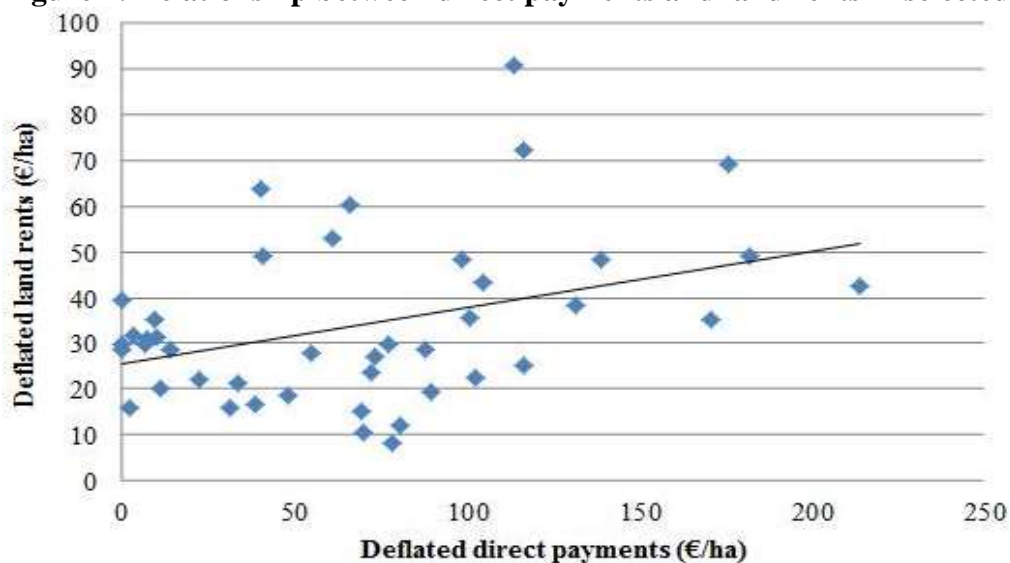
There are 5 countries included in the empirical analysis: Czech Republic, Poland, Slovakia, Hungary and Lithuania. For Czech republic we use yearly data from 1995 to 2007, for Poland data from 1994 to 2006⁸, for Slovakia and Hungary data are available from 2001 to 2007 and finally for Lithuania data are covered from 2002 to 2007. This results in an unbalanced panel data set with 43 observations. Based on some preliminary

⁷ In addition to regional productivity, coupled direct payments also depend on the individual production choice of the farmer. However, on a country level we believe that the production structure is relatively stable over the time period that we consider, such that including country fixed effects eliminates a large share of the endogeneity bias.

⁸ Note that we dropped the land rents observation of 2007 for Poland from the sample as this was an outlier.

evidence we already see that there is a strong correlation between direct payments and land rents (Figure 2).

Figure 2: Relationship between direct payments and land rents in selected NMS



4.2. Discussion of the regression results

The results of our estimation are presented in Table 3. The first column (model A) presents the estimation results of a restricted fixed effects model in which we only include direct payments (*DP*) as an explanatory variable. The second column (model B) presents also the estimation results of a restricted model in which we include in addition to direct payments (*DP*) also market return (*MKR*) as an explanatory variable. Finally, the third column (model C) presents estimation results of the full model.

Direct payments (*DP*) are found to have a positive and significant impact on land rents, indicating that there is rent extraction of government payments by land owners. The impact is not only statistically significant, it is also economically significant. An increase of 100€ per ha in direct payments, increases land rents by 10 to 15€. This means that 10% to 15% of the direct payments are directly capitalized in the land rent. Hence, in countries where a significant proportion of the land is rented and the landowner are not the farmers, a substantial part of the direct payments will not benefit the farmers and will flow out of the agricultural sector.

Further, we find that higher levels of market return (*MKR*) are correlated with higher rental prices. An increase of 100€ per ha in the average market return, is expected to lead to an increase of the average rental price by 1,5€.

Also *IP* is found to have a positive impact on land rents, which suggests that an increase in the real prices of substitutes for land leads to an increase in land rental prices.

Surprisingly, *EBRD* is not found to have a significant impact on land rents, but we need to remark that there is a substantial correlation between *EBRD* and *DP* (0.66). This may inflate the standard errors such that it is more difficult to detect an effect (Wooldridge, 2002).

Table 3: Regression results of the fixed effects model

	Model A		Model B		Model C	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
DP	0.15	(10.80)***	0.11	(5.79)***	0.11	(4.40)**
MKR	-	-	0.03	(14.62)***	0.02	(2.77)**
EBRD	-	-	-	-	3.96	(0.75)
IP	-	-	-	-	0.23	(2.47)*
Constant	23.80	(25.16)***	0.623	(0.37)	24.18	(1.21)
F-value	116.58 (0.00)		196.93 (0.00)		148.02 (0.00)	
Within R ²	0.60		0.67		0.70	
Overall R ²	0.15		0.53		0.54	
Observations	43		43		43	

*significant on 10%, **significant on 5% and *** significant on 1%

We used clustered standard errors.

Source: authors' calculations based on the constructed sample

5. CONCLUSION

While agricultural subsidies were introduced to increase the income of the farmers, agricultural subsidies also induce second-order adjustments so that they alter farmers' production incentives and thus factor demand. In this paper, we estimate the second order effect of one particular type of subsidy, being direct payments, on the rural land market in selected NMS. We present the empirical evidence of a natural experiment being the accession of several countries to the EU where as a result of accession CAP measures have been introduced. This resulted in a considerable change in the level and type of subsidies paid in the NMS and allows to estimate the impact of the increase in direct payments on land rental prices. We find that direct payments (*DP*) have a positive and significant impact on land rents, indicating that there is rent extraction of government payments by land owners. This impact is not only statistically significant, it is also economically significant. An increase of 100€ per ha in direct payments, increases land rents by 10 to 15€. Since renting is widespread in several NMS and since most land owners are so called *absentee* landowners who live in urban areas or who are no longer active in agriculture, the payments are to a large extent missing their goal of improving the livelihoods of rural inhabitants in the NMS.

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