

Single Payments of the CAP: Where Do the Rents Go?

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Abstract

Based on a simple graphical model we analyze the effects of the single payment scheme (SPS), introduced in the EU in 2003 on land prices and the distribution of rents. In particular, we are interested in if the single payments are capitalized into agricultural land values. All three different ways to implement the SPS are discussed: the historical model, the regional model and the hybrid model. We show that the outcome crucially depends on the proportion of eligible agricultural area to entitlements and which model is in place.

Key words: single payments, CAP, decoupling, agricultural land prices

Introduction

The 2003 Fischler Reform of the Common Agricultural Policy (CAP) of the EU entailed some significant changes. Perhaps the most important one is the introduction of the single payment scheme (SPS) which replaces most old schemes by one new single payment per farm. In addition, this payment is decoupled in a sense that farmers may use their land for any agricultural activity with some minor restrictions. In fact, farmers do not even have to plant anything as long as they keep their agricultural area under a “good agricultural and environmental condition” (EC-Regulation 1782/2003).¹ In practice, EU member states have some freedom in implementing the SPS. They can choose to fully (Germany, Ireland, Italy, the UK, New Member States) or partially (all other countries) transfer the old schemes (mainly animal and area payments) into the new SPS. In addition, they can choose between the so called standard (or historical) model, where the single payments for any specific farm depends on its received payments in the reference period 2000 to 2002 (most EU-15 countries including Austria, Belgium, France, Greece) or the regional model, with the same payment per hectare for each farmer in a defined region or country (in Germany after 2012, the UK after 2011, all New Member States) and the hybrid model, a mixture of the two first mentioned models (in Denmark, Finland, Germany until 2013, Luxembourg, Sweden, the UK until 2012).

In practice, farmers receive a number of entitlements equal to the average hectares they planted in the reference period. They can sell the entitlements with and without land and they can lease out the entitlements with land. However, for each entitlement to be activated in each single year the farmer has to have one hectare of eligible land (either owned or leased). Given this, the SPS is not decoupled from land. Therefore, the question remains to what extent the single payments are capitalized into land prices. The study in hand contributes to this question. In particular, we adopt a simple graphical

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model initiated by Isermeyer (2003) to look at the different models (historical, regional, hybrid) and derive the effects on land prices and the distribution of rents. Obviously, this question is crucial for the future competitiveness of the EU agriculture since high land prices inhibit structural change.

The rest of this paper is organized as follows. Section 2 describes the utilized theoretical model. Section 3 derives the distribution of rents given the three different ways the SPS can be implemented. Section 4 discusses the results.

Theoretical model

In an attempt to model the effects of single payments on land prices our point of departure is a model developed in Isermeyer (2003). We adopt his model of the land rental market for the land (selling) market. Moreover, while Isermeyer (2003) assumed the same value for all payment entitlements our model includes situations with homogenous and heterogeneous entitlement values and is therefore able to capture the different ways of implementation in all EU countries. In addition, we also provide an analysis of the distribution of rents from single payments under different policy designs.

Since entitlements are tradable with and without land we distinguish between the market for land and the market for entitlements (Figure 1). The lower half of Figure 1 illustrates the land market. We assume that land is heterogeneous and therefore, the willingness to pay (WTP) for it is also heterogeneous and that this can be described by a continuous and linear function:

$$WTP_0 = \begin{cases} b_0 - \alpha a & \text{for } b_0 - \alpha a > M \\ M & \text{for } b_0 - \alpha a < M \end{cases} \quad (1)$$

where WTP_0 is the willingness to pay for land if there are no subsidies involved, but the farmer is obliged to fulfill some minimum requirements to keep land in “good agricultural and environmental condition.” Hence, WTP_0 is equal to the land value (or (net-)present value of land), the sum of expected and discounted residual returns from owning the asset land (Weersink et al. 1999; Goodwin et al. 2003).² b_0 is the WTP for land of the highest quality. a can be viewed as a variable which assigns to each hectare of land a number from 0 to A_1 (total available hectares of agricultural area in the specific region) ordered along their quality (and therefore the WTP for it) with higher numbers given to lower land qualities. α is a factor describing the marginal WTP for land quality. Therefore, α represents the heterogeneity of land. If $\alpha = 0$, land is homogenous. If α is large, land quality is very heterogeneous. Land has a positive value until A_3 . Farmers do not have to plant any crop on the land to be able to activate their entitlements. They can also choose to fulfill some minimum requirements to keep it in “good agricultural and environmental condition” (EC-Regulation 1782/2003). The (negative) present value of fulfilling these minimum requirements (as the sum of discounted yearly costs) are assumed to be the same for each type of land and are given by M . To the right of A_2 the present value from fulfilling the minimum requirements is less negative than from planting any crop.

The upper half of Figure 1 illustrates the market for single payment entitlements. We assume that the variability in single payments per hectare, and hence the variability in the WTP for entitlements can be described by a continuous, linear function:

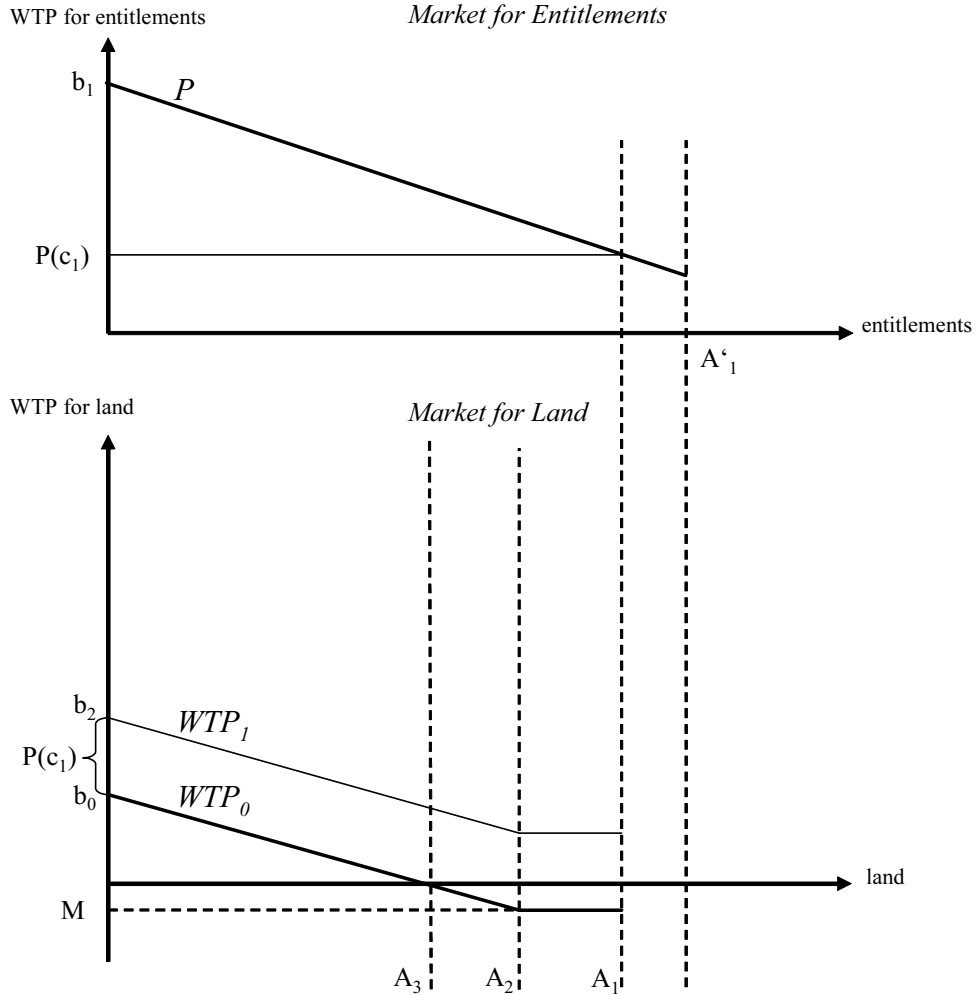


Figure 1. Markets for land and entitlements

$$P = b_1 - \gamma c, \tag{2}$$

where P is the WTP for single payment entitlements. Hence, P is equal to the present value of entitlements, what is equal to the sum of expected and discounted payments. b_1 is the WTP for the entitlement with the highest single payment. γ is a factor describing the heterogeneity of single payment entitlements. If $\gamma = 0$ single payments per hectare do not vary. This is the case of the regional model. A large γ implies a large range of single payments per hectare. c can be viewed as a variable which assigns to each entitlement a number from 0 to A'_1 (the total number of entitlements) ordered along their present value with higher numbers given to lower values. Since one hectare of land is needed to activate one entitlement, c also measures hectares. Hence, A'_1 is the amount

of hectares necessary to activate all allocated entitlements. To account for the fact that the hectares with a large net-present value in the lower panel do not necessarily correspond with the entitlements with a large present value in the upper panel, we use A' in the upper panel and A in the lower panel. This has no effects on our analysis of the distribution of rents later on, since we are only interested in the aggregated effects rather than the rents of each single farmer.

The ratio of entitlements (A'_I) to land (A_I) may differ over regions and time. One argument that the number of entitlements will exceed the number of hectares in the medium run is the fact that some percentage of agricultural land is reallocated to housing and industrial purposes each year. Beside that, government could allocate more entitlements than hectares right from the beginning, since they are allowed to allocate entitlements to farmers who otherwise would not have entitlements, e.g. newcomers (EC-Regulation 1782/2003). However, there are also arguments that the number of hectares can exceed the number of entitlements. It is not expected that all farmers who are eligible actually apply for entitlements. This obviously depends on the value and number of the entitlements a farmer can request. Just think of a farmer who can apply for two entitlements worth 50€ each. In such a case the transaction costs of applying (and maybe also of fulfilling the cross-compliance regulations) might be larger than the expected value of these two entitlements. It can be assumed that there tend to be more entitlements in the regional and hybrid model (where all land is eligible for entitlements) as in the historical model (where eligibility depends on if there were payments in reference period).

We first assume that there are more entitlements than hectares $A'_I > A_I$. In this situation of an oversupply of entitlements the price of entitlements is (close to) zero. Farmers holding more entitlements than land can not activate all entitlements. Therefore, they are willing to sell them for less than their value. Assuming perfect competition among farmers with entitlements without land they will compete to a price of zero.

One can look at the same problem from a different perspective. Instead of trying to sell their surplus entitlements farmers without sufficient land could also try to buy land. The maximum price they are willing to pay is the present value of the land plus the present value of the entitlement they could activate with this land. Again, assuming perfect competition those farmers with entitlements to the right of A_I will fail to get land since they can not offer a high enough price. Given that sellers of land do not know the values of the entitlements of the farmers to whom they sell their land, the owners of entitlements to the left of A_I have to pay marginally more than the owners to the right of A_I are able to do to get land. Therefore, they will offer a price equal to $WTP_I = WTP_0 + P(c_I)$, where $P(c_I)$ is the value of the entitlement c_I which just gets some land.

$$WTP_1 = \begin{cases} b_2 - \alpha a & \text{for } b_0 - \alpha a > M \\ P(c_1) - M & \text{for } b_0 - \alpha a < M \end{cases}, \quad \text{with } b_2 = b_0 + P(c_1). \quad (3)$$

In this situation of an entitlement surplus the SPS increases the WTP for land compared to a situation without entitlements from WTP_0 to WTP_1 . The extent of capitalization depends on the proportion of single payment entitlements to land and the variability of single payments. As long as A_3 is to the left of A_I the SPS will lead to the cultivation of unprofitable land (or keeping unprofitable land in a cultivatable condition).

Welfare Analysis

Historical Model

For better being able to illustrate the welfare effects of the SPS we introduce a curve $G = WTP_0 + P$ in the lower panel of Figure 2.³

$$G = \begin{cases} (b_0 + b_1) - (\alpha + \gamma)a & \text{for } b_0 - \alpha a > M \\ (b_1 + M)\gamma & \text{for } b_0 - \alpha a < M \end{cases} \quad (4)$$

We still consider the case of $A'_1 > A_1$. In the upper part of Figure 2 area A depicts the net-present value of all entitlements. Assuming that the private and public discount rate and expectations are the same, area A represents also the present public costs for the

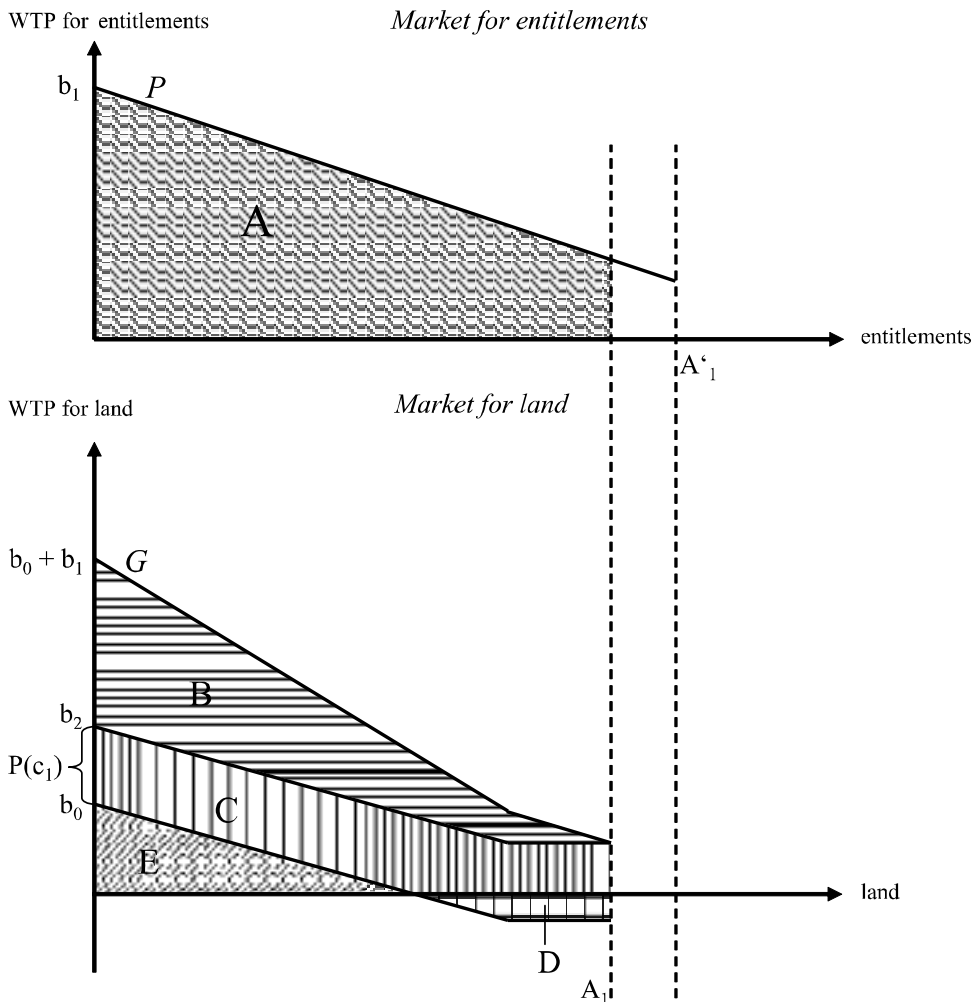


Figure 2. Welfare effects of historical model with entitlement surplus

SPS, i.e. the hypothetical costs of the European Commission to buy itself out from its obligations regarding the issued entitlements in the present. The lower part of Figure 2 depicts the distribution of rents from owning land and from owning entitlements. Area *B* illustrates the rents from entitlements which stay with the owners of the entitlements while area *C + D* is transferred to the owner of land through land prices. Hence, this is the part of the single payments which are capitalized into land values. The traditional Ricardian land rent (= rent from cultivating land or in this case also from keeping it in cultivatable condition, but not including the part of the entitlement rent capitalized into land values) is $E - D$. Therefore, the overall rent from owning land is $C + E$. Area *D* illustrates social costs (deadweight losses) to society because unproductive land is kept in production or in a cultivatable condition⁴.

Let's now discuss the case of a surplus of land $A'_2 < A_1$. In Figure 3 the number of

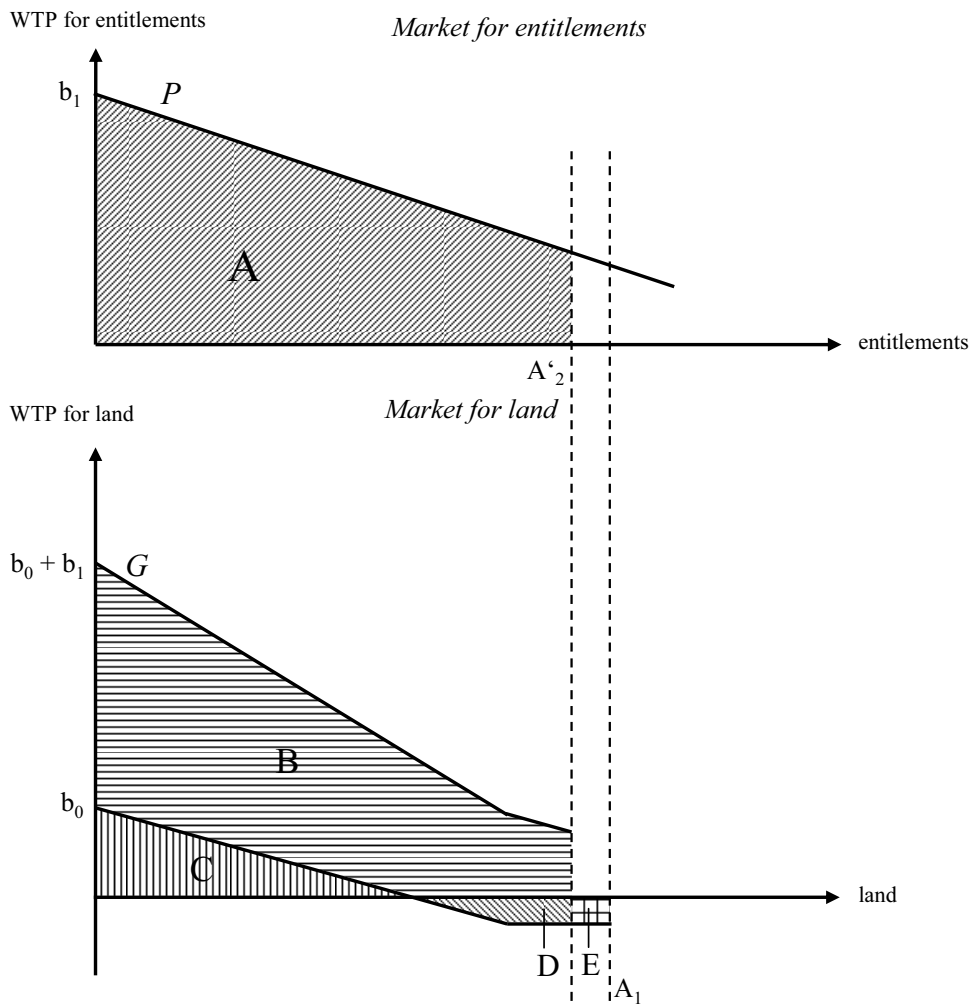


Figure 3. Welfare effects of historical model with land surplus

entitlements A'_2 is less than the available agricultural area A_1 . In this case farmers with land and no entitlements would be willing to buy entitlements. The maximum WTP for an entitlement is the present value of the entitlement. The same is true for the minimum willingness to accept a sale by the owner of an entitlement.⁵ Therefore, all rents from the entitlements $A = B + D$ stay with the owners of the entitlements. The rent from owning land includes only the Ricardian land rent $C - D$. Area D illustrates social costs to society because unproductive land is kept in production or in a cultivatable condition. However, D is smaller than in the case of an entitlement surplus by area E . Some unproductive land is taken out of production.

Regional and Hybrid Model

Let's now switch to the regional model where every hectare of agricultural area receives the same single payment. Hence, as depicted in Figure 4, the willingness to pay

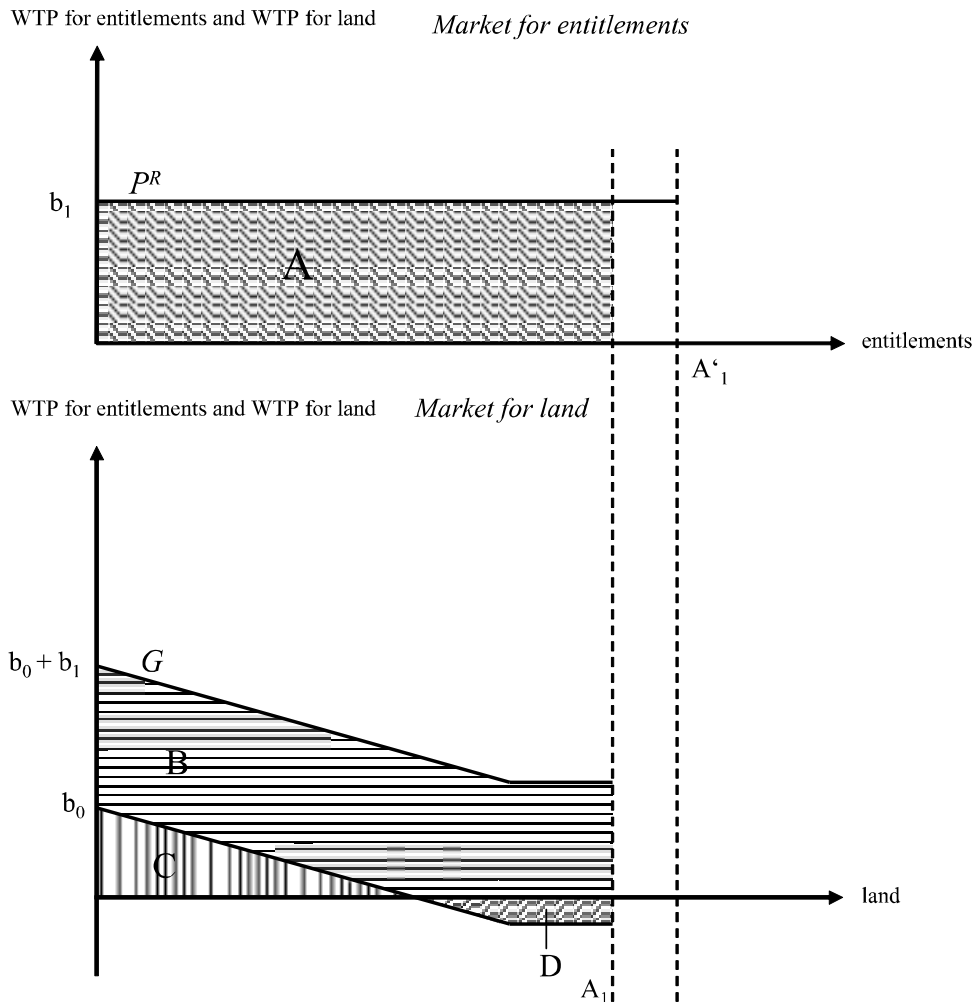


Figure 4. Welfare effects of the regional model with entitlement surplus

P^R is the same for all entitlements. As long as there is an entitlement surplus ($A'_1 > A_1$), owners of entitlements without land are willing to pay the present value of the land plus the present value of the entitlement they could activate with this land. Hence, the single payments are fully capitalized into land prices $A = B + D$. The Ricardian land rent is $C - D$ and the overall rent from owning land is $B + C$. D illustrates again social cost.

If there is a surplus of land, as illustrated in Figure 5 ($A'_2 < A_1$), the same logic applies as in the case of the historical model and land surplus. All rents from the entitlements $A = B + D$ stay with the owners of the entitlements. The rent from owning land includes only the Ricardian land rent $C - D$. Area D illustrates social costs to society because unproductive land is kept in production or in a cultivatable condition. However, D is smaller than in the case of an entitlement surplus by area E . Some unproductive land is taken out of production.

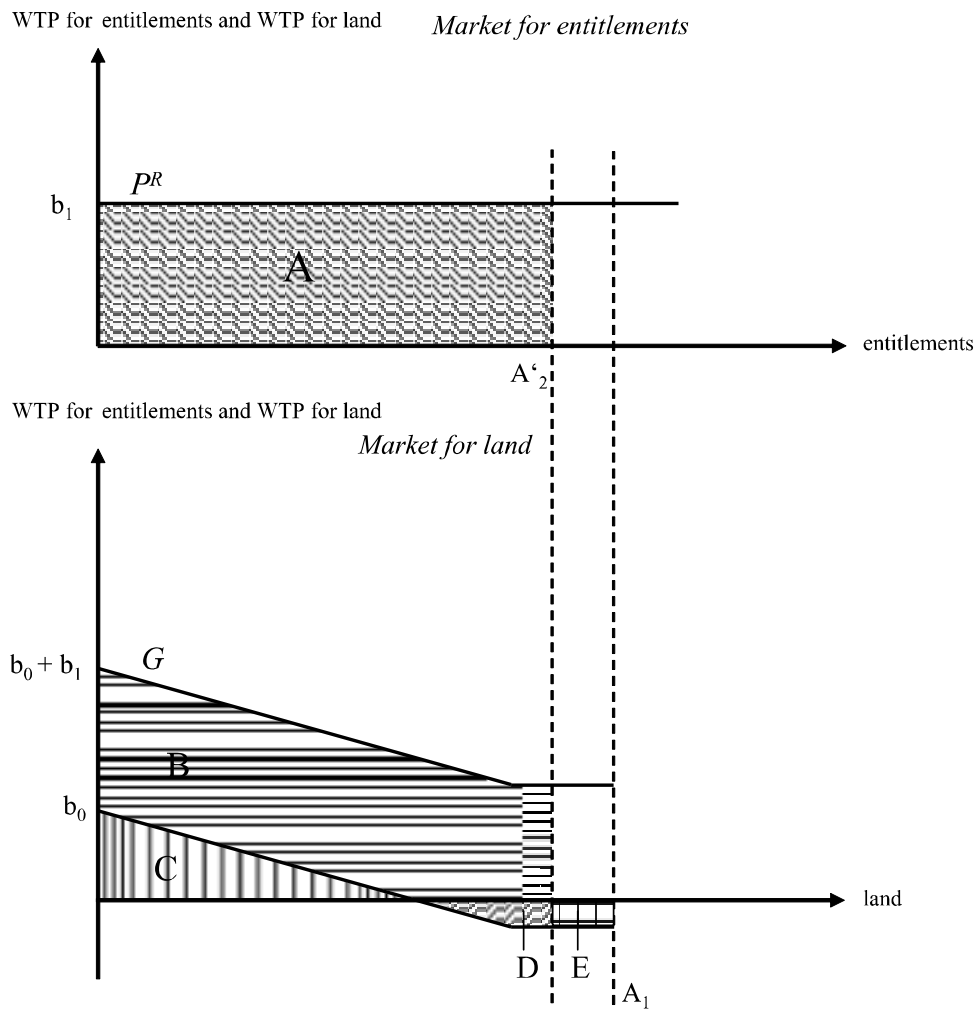


Figure 5. Welfare effects of the regional model with land surplus

In the case of the hybrid model part of the single payments per hectare are the same for every area and part is farm specific. The market for entitlements in this case is illustrated in Figure 6. Therefore, if there is an entitlement surplus, the distribution of rents follows the same logic as in the historical model in Figure 2. Part of the single payments are capitalized into land prices and part of it stays with the owners of the entitlements. The degree to which single payments are capitalized into land prices crucially depends on what proportion of single payments are farm specific. Given a fixed amount of single payments the share capitalized into land prices will always be larger in the hybrid model compared to the historical model.

If there is a surplus of land, the result is the same as in the two other models (Figure 3 and Figure 5). All rents from the entitlements stay with the owners of the entitlements.

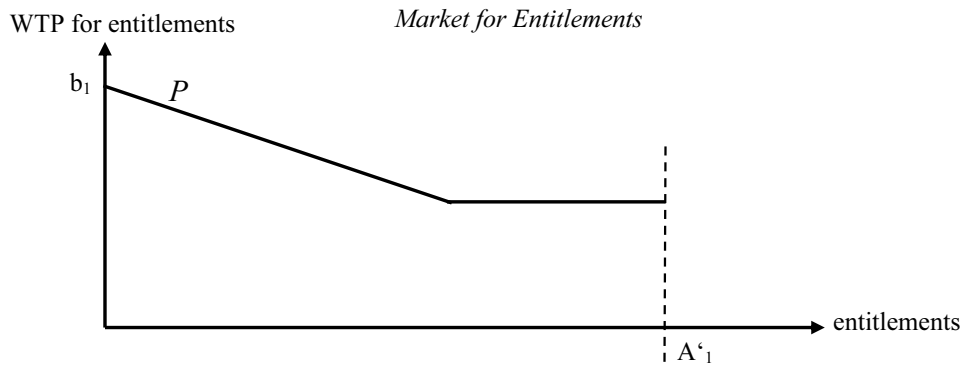


Figure 6: Market for entitlements in the hybrid model

Conclusions

The CAP 2003 Reform introduced single payments which are quite decoupled from farmers' production decisions. The OECD (2004) showed that this change will improve the transfer efficiency of agricultural support significantly. It is also very likely that the new single payment scheme (SPS) will be accepted as trade non-distorting in the WTO negotiations and will therefore be classified as "Green Box" payments (Swinbank, 2005). The effects of the SPS on land prices, and therefore structural change, are not that clear. With tradable entitlements the European Commission introduced a new tool. Since entitlements can only be activated if they are accompanied by the same number of eligible hectares of land, they are not fully decoupled from land. In addition, the way the SPS is implemented in the EU member states varies significantly between countries. While in some countries the amount of single payments is based on a historical reference amount (historical model), other countries have fixed payments per hectare (regional model) and even other countries combine these two models.

Our study shows that the degree to which the single payments are capitalized into land values crucially depends on the model in place and the ratio of entitlements to land. As long as the number of eligible hectares exceeds the number of entitlements the single payments are not capitalized into land prices. This is true for all three models. Ultimately, it is the number of suppliers and demanders on the entitlement market, what

will determine the outcome. If there is a surplus demand, entitlements will have their own value decoupled from land. In the case of the regional and the hybrid model we can assume that the number of entitlements is approximately the same as available hectares of agricultural land. One could argue that since some very small farmers will not apply for their entitlements (transaction costs exceed present value of entitlement), there will be a surplus of land. However, we can not expect these small farmers to become demanders on the entitlement market. Even if there is a surplus of land at the time of the introduction of the SPS, the agricultural area is decreasing every year by approximately 0.4 % on average for EU-15 based on the years 1990-2001. Moreover, government can circulate more entitlements than hectares right from the beginning, since they are allowed to allocate entitlements to farmers who otherwise would not have entitlements, e.g. newcomers (EC-Regulation 1782/2003).

Our analysis assumes perfect information of participants in land and entitlement markets and no transaction costs of transferring land and entitlements. This is not true in reality. There is not the single big (stock) exchange where entitlements are traded, where the whole demand and supply meets and where transfers follow a standardized procedure. This can lead to market imperfections and situations where a single farmer has difficulties to find a buyer for her entitlements, even though in general demand exceeds supply.

If the number of entitlements exceeds the number of hectares the outcome is different for all three models. In the case of the historical model, part of the single payments is capitalized into land values. The extent of capitalization depends on the proportion of single payment entitlements to land and the heterogeneity of entitlement values. In the extreme case of identical single payments for each hectare, the result is the same as in the regional model with all rents from entitlements capitalized into land values. In the case of the hybrid model, the degree of capitalization lies somewhere between the other two models (given the same overall amount of single payments).

Given this, it is not very likely that we will see significant decreases in land prices in many regions of the EU. Since the single payments also include former subsidies for animal production, land prices might even increase. Moreover, one might observe different developments of land prices in different regions, depending on how the SPS is implemented. As a consequence, this might lead to differences in the competitiveness between regions.

Notes

- ¹ However, farmers have to comply with some basic standards regarding “the environment, food safety, animal health and welfare and good agricultural and environmental condition” (EC-Regulation 1782/2003). These cross-compliance regulations are not considered in this study.
- ² It is clear that we have to abstract here from many difficulties involved in measuring the net-present value of land, and entitlements later on, including that farmers have heterogeneous expectations and risk attitudes.
- ³ Curve *G* suggests that land with the highest value is linked to entitlements of the highest value. Though this is not necessarily the case in reality, it is no problem for our aggregated analysis of rents.
- ⁴ Obviously, we do not consider any potential positive externalities from keeping the

landscape open.

- ⁵ Obviously, throughout the analysis we assume that all individuals have the same risk preferences and expectations for the future.

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