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Working Paper

Study on the Functioning of Land Markets in the EU Member States under the Influence of Measures applied under the Common Agricultural Policy

EERI Research Paper Series, No. 04/2008

Provided in Cooperation with:

Economics and Econometrics Research Institute (EERI), Brussels

Suggested Citation: Swinnen, Johan; Ciaian, Pavel; Kancs, d'Artis (2008) : Study on the Functioning of Land Markets in the EU Member States under the Influence of Measures applied under the Common Agricultural Policy, EERI Research Paper Series, No. 04/2008, Economics and Econometrics Research Institute (EERI), Brussels

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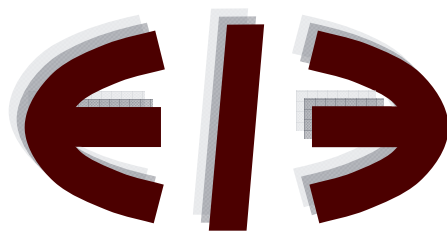
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ISSN: 2031-4892



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**STUDY ON THE FUNCTIONING OF LAND MARKETS IN THE EU
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APPLIED UNDER THE COMMON AGRICULTURAL POLICY**

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2008

STUDY ON THE FUNCTIONING OF LAND MARKETS IN THE EU MEMBER STATES UNDER THE INFLUENCE OF MEASURES APPLIED UNDER THE COMMON AGRICULTURAL POLICY

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1. INTRODUCTION

The background to this paper is the establishment of the single payment scheme (SPS), providing decoupled support to farmers, which was the central element of the 2003 reform of the common agricultural policy (CAP). The member states of the EU-15 had to implement the SPS at the latest by 2007, but had some flexibility in the way they did so. Member states could opt to apply payment entitlements based on historical, individual reference amounts (the 'historical model') or alternatively, payment entitlements calculated as averages of the historical reference amounts of the region concerned (the 'regional model') or a mix of the two approaches, in either a static or dynamic form (the 'hybrid model').

Economic theory, as well as empirical findings, suggests that the way in which agricultural support is provided has an influence on land markets, because payments capitalise to some degree into land values, affecting both the sales and rental prices of land. These effects would in turn have a bearing on the transfer efficiency of support, on structural change and so forth. Yet, the kind of agricultural support given is not the only factor influencing land markets. The profitability of production, user competition (driven by environmental concerns and demographic changes), ownership and production structures, and the institutional setting of land markets are other factors that need to be taken into account. Many of these conditions vary greatly among and within the EU member states (Alston and James 2002; Floyd (1965; Gardner 1983; Guyomard, Le Mouël and Gohin 2004; Salhofer 1996).

The overall objective of this paper is to investigate whether and to what extent the different means of implementation of the SPS have affected i) the capitalisation of support into land values (sales and rental prices); ii) the distribution of this capitalisation to the different owners; iii) the effect of the SPS, in combination with the institutional setting of land markets, on structural change in agriculture; and iv) the reaction of land markets and asset values to changes in policy. In contrast to previous simulation exercises, the focus of this paper is on

providing an empirical underpinning of policy influences on the land market (Swinnen, Ciaian and Kancs 2008).

To guide our analysis, the empirical and theoretical literature in this field has been analysed in detail and a theoretical framework has been developed to study the impact of direct payments and the SPS on land market values under a range of conditions. The insights from this literature review and from theoretical analysis have been used in the interpretation of the empirical findings from this paper (Ciaian, Kancs and Swinnen 2008; Courleux et al 2008; Kilian and Salhofer 2008).

The empirical analysis in this paper is based on a combination of data sources. In particular, we combine insights from comparative data analyses based on data from Eurostat and the Farm Accountancy Data Network (FADN) with data analyses and information collected from a series of country and regional (sub-country) studies. More specifically, as part of the overall paper, 11 country studies and 18 regional studies have been undertaken. An important criterion in the selection of countries and regions has been the coverage of different implementation models of the SPS. The countries covered are Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Spain, Sweden and the UK. For France, Germany, Italy, Spain and the UK, two or more regional studies have been conducted (for more details see Swinnen, Ciaian and Kancs 2008).

The results from our paper are subject to certain analytical limitations, however. First is the scarcity of data on land values and transactions since the SPS was launched. The short time span since implementation of the SPS, combined with the varying quality of the available data, do not allow econometric analysis. Second, although we have systematically verified our data sources and our findings draw on several sources of information, the qualitative analysis in the present paper does not allow us to assess confidence intervals nor does it allow us to perform sensitivity analyses or to check the statistical robustness of the results. Third, land regulations and long-term contracts may delay the capitalisation of the SPS into land values beyond what can currently be observed in the data. Fourth, global food markets have experienced major changes over the past few years, making it complicated to isolate the effect of the SPS on agricultural land markets. The results reported here should thus be interpreted keeping these limitations in mind.

Despite these limitations, the paper offers interesting hypotheses and preliminary evidence on land market developments in the EU study countries (EUSCs) and the effects of the SPS. The role of the SPS in influencing land values and the operation of land markets is analysed under the following themes: land market developments, drivers of land values, the impact of changes in the SPS on land values, the distribution of direct payments and the effects on structural change.

2. IMPLEMENTATION OF THE SPS

The beginnings of the CAP date back to the period of formation of the European Economic Community (EEC) in 1957. The emphasis of the early CAP was on encouraging agricultural productivity, maintaining a stable supply of affordable food for consumers and ensuring a viable agricultural sector. The support to farmers was implemented predominantly through a price support system, by which farmers were guaranteed high prices. This early CAP had a major impact on agricultural markets. Most importantly, it led to a high rise in farm productivity and created large surpluses of the major farm commodities in the EU market, some of which were exported (with the help of subsidies), others of which had to be stored or disposed of within the EU. These measures had a high budgetary cost and distorted world markets. At the same time, there were increasing concerns about the environmental sustainability of agriculture.

To circumvent these developments, some important changes to the CAP were made in the 1980s, but especially at the beginning of the 1990s. The first substantial reform of the CAP occurred in 1992, known as the MacSharry reform, followed by the Agenda 2000 reform. To reduce market imbalances, domestic prices were reduced and the income loss to farmers was redressed through compensatory direct payments. The amounts of these payments depended on historical rather than current production. These reforms thus cut the link between support to farmers and production. Yet, farmers were still obliged to produce certain agricultural commodities in order to obtain the direct payments. At the same time, a ceiling was put on subsidy expenditures to keep the costs of the CAP under control.

In 2003, EU farm ministers adopted another substantial reform to the CAP. The 2003 CAP reform decoupled most of the direct payments by introducing the SPS. In the same time, member states were allowed to maintain some specific subsidies coupled to production. The direct payments under the new system are linked to compliance with environmental, food safety and animal welfare standards, as well as the requirement to keep land in good agricultural and environmental condition (i.e. cross-compliance requirements).

2.1 SPS implementation models

The CAP reform of 2003 launched the policy by which farm subsidies are determined as a fixed set of payments per farm – the SPS. Under the SPS, the farmer is entitled to a yearly payment depending on the number of payment entitlements and eligible hectares (s)he possesses.

When it came to implementing the SPS, member states could choose among the historical, regional and hybrid models. Under the historical model, the SPS payment is farm-specific and equals the support the farm received in the reference

period. This is the most common SPS model (Table 1). Under the regional model, an equal per-hectare payment is granted to all farms in the region.

The hybrid model is a combination of the historical and regional models. Member states could also choose between a dynamic and a static version of the hybrid model. If a member state has implemented the dynamic hybrid model, there is a phased move towards a model that is fully regional. The historical component gradually decreases while the regional component gradually increases over time. For example, England, Finland and Germany have implemented the dynamic hybrid model. On the other hand, if a member state has applied the static hybrid model, neither the regional nor historical shares change over time (e.g. Northern Ireland and Sweden) (see Table 1 and Table 2 for more details).

3. CONCEPTUAL FRAMEWORK

Since the focus of the paper is on examining what has happened to land markets since the SPS was introduced, we need to understand the impact of policies generally before and after its launch. For this reason, we look at the effects of both coupled and decoupled subsidies.

3.1 The basic model

3.1.1 *Coupled subsidies*

For reasons of exposition, we start with a simple model of the agricultural sector, in which we consider two factors used to produce one agricultural good $Q = f(A, K)$. Land (A) and the composite of labour and capital (K) are combined in a constant returns-to-scale production function. Output market clearing and input market clearing conditions determine the output and input prices. We begin with the assumption of constant elasticities of factor supply and the elasticity of demand.

The capitalisation of agricultural support payments into land values depends largely on the land supply, the input substitution elasticities and whether subsidies are linked to land. The more inelastic the land supply, the more subsidies are capitalised into land values. Everything else being equal, subsidies linked to land (area payments) are more capitalised into land values than other coupled subsidies are (Floyd, 1965; Gardner, 1983; Alston and James, 2002).

If the land supply is fixed, then area payments are fully capitalised into land values. Coupled production subsidies are fully capitalised into land values if in addition to a land supply elasticity of zero either the supply elasticity of non-land inputs is perfectly elastic or the factor proportions are fixed. In other situations, the benefits from coupled subsidies are shared between land and other production factors. If demand elasticity is not perfectly elastic, then consumers benefit as well

from coupled subsidies. Theoretically, the impact of the agricultural policy on land values may be very large (e.g. fully capturing the subsidies).

In empirical studies, land supply elasticity is usually found to be rather low, mostly owing to natural constraints. For example, based on an extensive literature review, Salhofer (2001) concludes that a plausible range of land supply elasticity for the EU is between 0.1 and 0.4. Similarly, Abler (2001) finds a plausible range between 0.2 and 0.6 for the US, Canada and Mexico.

Input substitution elasticities are a further crucial factor determining the distributional consequences of agricultural policies.¹ With area payments, farms have an incentive to substitute other inputs for land, which increases land demand and leads to the capitalisation of subsidies into land values. Where there is high elasticity of substitution between land and other inputs, the impact of an area subsidy on land values that is induced will be large, as high elasticity of substitution indicates close substitutability between land and other farm inputs in the production process. Subsidies that are not targeted at land have the opposite effect. A high elasticity of substitution between land and other farm inputs reduces the impact of these subsidies on land values (Floyd, 1965; Gardner, 1983; Alston and James, 2002). Based on 32 studies, Salhofer (2001) reports average elasticities of substitution between land and labour of 0.5, between land and capital of 0.2, and between land and variable inputs of 1.4 for Europe. Similar values are reported in Abler (2001) for the US and Canada.

3.1.2 *Decoupled subsidies*

The capitalisation of decoupled subsidies depends on the way in which the policy is implemented, i.e. whether the subsidies are decoupled from sectoral choice, from land or from both.

The SPS is decoupled from production but land is needed to be able to activate SPS entitlements. Capitalisation of the SPS into land values depends on the number of entitlements distributed to farmers relative to the total eligible area (Ciaian et al., 2008; Courleux et al., 2008; Kilian and Salhofer, 2008).

If the number of entitlements is larger than the total eligible area, then the SPS is capitalised into land values. With fixed land supply, the SPS is fully capitalised into land values. Otherwise, the capitalisation of the SPS is partial and it decreases as land supply elasticity increases. The capitalisation of the SPS also depends on the SPS model implemented.

If, however, the number of entitlements is smaller than the total eligible area, then the SPS is not capitalised into land values. The benefits of the SPS accrue to

¹ Substitution elasticity measures how easy it is to substitute one input for another in the farm production function.

farmers. This result is general – it does not depend on the degree of land supply elasticity or the SPS model.

3.2 Insights from empirical studies

The empirical attempts to estimate the impact of agricultural support policies on land rents and land prices can be grouped into two broad categories: land value/price studies and land rent studies. Whereas the former examine the effects of policies on farmland prices, the latter investigate the policy impacts on farmland rental rates. The main reason authors use one approach over another is usually data: the availability of either land value (typically from regional datasets) or rental data (typically from farm-level surveys) commonly determines the choice of model.

It is important to point out that virtually all of the existing studies are on North America (the US and Canada). To our knowledge, only three cover EU countries (Traill, 1980; Goodwin and Ortalo-Magné, 1992; Duvivier et al., 2005). Moreover, none of these measures the impact of the SPS (Table 3; Table 4).²

In comparison with the hypotheses of theoretical models, several conclusions follow from the empirical studies.

First, coupled agricultural support policies do increase land rents and land prices, albeit less than theory predicts. Land rents/prices do not appear to capture the full value of coupled subsidies, at least in the short to medium run, but they do capture a substantive share of subsidy payments (most studies report 20-80%). The reviewed literature on land values and the determination of land rental rates suggests that land prices and land rental rates are guided by a large number of factors, such as policy support, land-use alternatives, competition on the land market and inflation, which may explain these discrepancies between theory and empirical evidence.

*Second, decoupled policy payments do affect land rents and land prices.*³ One way to interpret these results is that in the real world there are no truly decoupled subsidies. All decoupled subsidies applied in the EU or the US impose certain

² The large majority of empirical studies performed to date have estimated the present value of land as a function of government payments and other explanatory variables. The main reason for the relative dominance of land price studies is data availability – usually regional data are more broadly available (typically used in land price studies) than farm-level data (typically used in land rent studies).

³ The theoretical literature on decoupled subsidies shows that fully decoupled agricultural-support policies have no effect on land values, if markets are competitive and transaction costs are not prohibitive. It also shows that decoupled policies may affect land values only in the presence of some market imperfections.

restrictions on farms or are accompanied by other measures.⁴ Therefore, it is rather difficult to compare the empirically estimated impact of decoupled and coupled policies. Perhaps the subsidy that most closely resembles the decoupled subsidy definition is the production flexibility contract (PFC) payments introduced in 1996 by the Federal Agricultural Improvement and Reform (FAIR) Act in the US. The Act decoupled subsidies from contemporaneous production and removed all planting restrictions, including set-aside requirements. With the exception of certain fruits and vegetables, producers were given complete planting flexibility, while they still received subsidies based on their 1985 programme yield and their 1995 acreage base.

Third, landowners benefit from all support programmes, both coupled and decoupled. All the reviewed studies find that one additional unit of payment results in an increase of less than one land price unit. While these findings are not surprising in relation to decoupled subsidies, most of the empirical literature relates to coupled subsidies, which would be expected to have most (if not all) of their final effects on land. Nevertheless, the reviewed studies have found a surprisingly small share of coupled subsidy benefits going to landowners.

Fourth, the difference between the estimated impact of coupled and decoupled subsidies is not statistically significant. Comparing the empirical results from various studies, we find evidence that coupled payments do not have a significantly different impact on land values from that of decoupled payments. For example, Duvivier et al. (2005) find that the elasticity of Belgian land values with respect to partially coupled support (compensatory payments) is between 0.12 and 0.47. Kirwan (2005) estimates that the marginal effect of all government subsidies on farmland rental rates in the US is between 0.2 and 0.4. In contrast, Taylor and Brester (2005) find that the elasticity of land value with respect to market price support is between 0.16 and 0.32.

There are only a few studies that compare how the subsidy capitalisation differs between decoupled and coupled subsidies. Goodwin et al. (2003) find that, as predicted by the theory, coupled subsidies (LDPs) have a higher impact on land values than decoupled subsidies (PFC payments). The estimated marginal effect on land value is 6.6 for LDPs and 4.9 for PFC payments. In contrast, the results of Lence and Mishra (2003) suggest that decoupled payments (PFC and MLA payments) have a greater bearing on rents than coupled ones (LDPs). Moreover, the coupled subsidies are found to decrease rents. These estimates imply that rents

⁴ For example, in the case of the SPS, the payments have to be activated with land. To receive the decoupled subsidies, farmers must have a corresponding amount of land at their disposal. Hence, the total subsidies a farm can receive are constrained by the amount of subsidies received and land used in the reference period. The SPS is not conditional on cultivating the land, however. Thus, the SPS is still connected to land in some way although it is decoupled from contemporaneous production.

rise by around \$0.85 for each \$1.00 paid per hectare under the PFC and MLA programmes. In the case of LDPs, land rent is estimated to fall by around \$0.24 per \$1.00 of subsidy.

3.3 Implementation of the SPS and implications

From the previous analysis, we can conclude that the decoupled subsidies may still have an important impact on land values and that the implementation details of the policy matter considerably in this respect.

Therefore, we now turn to discuss some of the SPS implementation details and we present a series of hypotheses on how these may affect EU land markets. Note that the arguments in this section are solely based on the theoretical analysis. In the following sections, the theoretical hypotheses derived here are compared with empirical evidence from selected member states.

3.3.1 *The historical versus regional model*

The regional model is expected to lead to greater capitalisation than the historical model because, for a given land base, under the regional model more entitlements are allocated than under the historical model. A similar result holds for the hybrid model because the allocation of entitlements is grounded on the same principles as those of the regional model.

At the same time, even if under both models (historical and regional) the number of entitlements exceeds the eligible area, the regional model still leads to greater capitalisation of the SPS into land values than the historical model does. This is because under the historical model the entitlement value differs among farms, which induces partial capitalisation of the SPS into land values as farms with low-value entitlements cannot bid up land values higher than the value of their entitlements. Farms with higher-value entitlements partially benefit from the SPS. This is because when farms own more entitlements than the eligible area, they want to acquire additional land in order to be able to activate all the entitlements. This intensifies competition for land and exerts upward pressure on land prices. But farms with higher-value entitlements do not have to use the value of entitlements fully to out compete farms with lower-value entitlements. On the other hand, farms with lower-value entitlements must fully use their entitlement value to maintain the amount of land or to minimise the land-use losses. Hence, farms with higher-value entitlements partially use the value of entitlements to compete for land and thus partially benefit from the SPS. In contrast, the farms with lower-value entitlements need to use the full value of entitlements to compete for land and consequently do not benefit from the SPS.

3.3.2 *Entitlement tradability*

Tradability matters under some conditions. If the eligible area is larger than the total number of entitlements, then with full tradability of entitlements there is no

capitalisation of the SPS into land values. The less tradable entitlements are, the more the SPS becomes capitalised into land values. A low tradability of entitlements reduces the incentive of farmers who may want to sell entitlements actually to do so because they cannot obtain the desired entitlement price. With low tradability, these farmers prefer to keep their entitlements and to use them to compete for land, which exerts an upward pressure on land prices. If the eligible area is smaller than the total number of entitlements, the greater is the capitalisation of the SPS into land values and the lower is the market price for entitlements. With full capitalisation of the SPS, the market price for entitlements is zero.

3.3.3 New entrants' eligibility for entitlements

The capitalisation of the SPS additionally depends on the level of new farm access to entitlements. The more eligible that new farms are for entitlements, the greater is the capitalisation of the SPS into land values. If the newly entering farms are eligible for SPS entitlements from the national reserve, then the SPS will be capitalised into land values. The eligibility of new farms for entitlements increases the competition for land. The capitalisation of the SPS into land values also depends on the value of new farms' entitlements relative to the value of pre-existing entitlements.

3.3.4 Conditional SPS payments

Depending on the nature of the conditions, farm gains from the SPS may be reduced. If the additional requirements imposed by the SPS were not present before implementation of the SPS and are not required for non-participating farms, then net benefits from the SPS may be squeezed by the implementation costs of the additional requirements. Although conditional SPS payments may diminish farm benefits from the SPS, depending on the nature of the conditions, they do not affect land capitalisation (which is equal to zero).

3.4 Static versus dynamic effects

The impact of the SPS is different in the short-term (static) relative to the long-term (dynamic) perspective.

Structural changes are likely to be more significant in the long run than in the short run. Structural changes may be the result of, for example, technological or institutional innovations, or vertical coordination. In the presence of imperfect rural credit markets, the SPS itself may reduce farms' credit constraints and thereby have an impact on land markets (see Ciaian and Swinnen, 2009). In combination with structural changes, the SPS may be capitalised into land values and may affect the restructuring of the agricultural sector. This outcome is conditional, however, on whether entitlements are tradable.

At the same time, structural change will induce the trading of entitlements. Entitlement trading will be driven by the reallocation of land among farms. If the reallocated land is used to activate entitlements, then an equivalent number of entitlements will be traded. That being stated, trade in entitlements will depend on the development of the entitlement market and entitlement trade restrictions.

In the short run, the SPS will likely have a limited impact on land markets and capitalisation of the SPS into land values because structural changes are expected to be minor. That is the view taken by this paper, as there are relatively few observations available since the SPS was implemented.

Nevertheless, there is a difference between the historical model and the regional (or hybrid) model. Depending on the country, the SPS was implemented between 2005 and 2007, but the allocation of entitlements under the historical model was based on the eligible area that farms operated in the reference period 2000–02. Under the regional (or hybrid) model, the allocation of entitlements was based on the total eligible area in the first year the SPS applied. As a result, if structural changes occurred between the periods 2000–02 and 2005–07, then in the short run one would expect a larger impact of the SPS on land markets with the historical model than with the regional (hybrid) model.

In the long run, the SPS will have a more pronounced impact on land markets under all three of the SPS implementation models. In combination with structural changes, the SPS may be capitalised into land values and may affect the restructuring of the agricultural sector. The level of the capitalisation of the SPS and the impact on restructuring depends on the tradability of entitlements. The lower the tradability of entitlements, the more the SPS will be capitalised into land values and the more it will constrain restructuring. The historical and hybrid models may or may not have a greater effect on capitalisation and restructuring than the regional model does.

4. EMPIRICAL ANALYSIS

4.1 Land market developments in the EUSCs

The amount of rented land and the volumes of rental transactions differ greatly among the EUSCs. Farms in Belgium, France, Northern Ireland and Germany are more likely to rent land (more than 65% of the land used). In Sweden, farms rent approximately 50% of the agricultural land used. In contrast, the prevalence of land renting is lowest (17%) in Ireland. In the rest of the countries covered by this paper, farms rent between 34% and 43% of the land used. The share of rented farmland of the total UAA is increasing in most of the EUSCs (Figure 3).

Agricultural land prices also vary widely across the EUSCs. In the peak years, differentials between the most and least expensive countries exceeded 2,000% – ranging from around €2,000/ha in parts of Sweden to over €40,000/ha in parts of the Netherlands. These figures imply that awarding the same amount of subsidy

per hectare of agricultural land would have quite diverse impacts on land prices (Figure 4 - Figure 6).

The variation in rental prices is somewhat lower than in sales prices but large differences are likewise apparent. The difference in rental prices between the lowest and highest country was around six to one in 1992 and more than seven to one in 2006 (Figure 1, Figure 2).

Changes in agricultural land prices over the past decade have been diverse as well. Over the period from 1992 to the present, real farmland sales prices have decreased by around 25% in Greece, while increasing by around 250% in Ireland. Developments in rental prices since 1992 range from a decline of around 25% in Finland to a rise of around 55% in Spain (Figure 4, Figure 5).

This cross-country heterogeneity in agricultural land markets suggests that farmers and landowners in these various land markets may be affected differently by (changes in) the CAP.

4.2 Drivers of land values

Agricultural commodity prices and productivity, infrastructural expansion and urban pressures have marked influences on land markets, but their relative importance differs for rental and sales markets (Table 5, Table 6). First, agricultural commodity prices and productivity are significant drivers of agricultural land prices, but their effects seem to be more striking for rental markets than for sales markets. Second, urban pressures – such as growing housing demand – have pronounced effects on agricultural land prices, especially in densely populated EUSCs (e.g. Belgium and the Netherlands) and faster growing economies (e.g. Ireland and Spain). The same applies to the role of infrastructural expansion in driving up land prices. The latter two factors in particular influence sales prices.

Land market regulations affect land prices and exchanges – especially land rentals. Rental prices for agricultural land tend to be more regulated by governments than sales prices. In one-third of the EUSCs, the maximum rental prices are set by the government (Table 7, Table 8).

The duration of rental contracts is regulated in some of the EUSCs, which influences the responsiveness of the rental market to agricultural policy changes. The length of rental contracts is regulated by the government in Belgium and France (with a contract duration of nine years minimum), the Netherlands (six years minimum) and Spain (five years minimum). In several EUSCs (e.g. France), the renewal/inheritance of rental contracts is also regulated. In these countries, formal rental markets are stickier and the time lag is longer in adjusting to policy changes. The prevalence of land renting is typically higher in countries with strict rental market regulations, such as Belgium and France. These two countries have the highest minimum lengths of rental contracts (nine years) and the highest shares of rented area (77% and 75% in 2006, respectively) among all the EUSCs.

Land taxes differ significantly across the EUSCs. Three kinds of tax regulations that affect market participants' decisions to buy, own or sell agricultural land have been studied: sales taxes, purchase taxes and ownership taxes. Tax rates for land transactions are heterogeneous across the EUSCs, spanning from 1% for low-value land in the UK to 18% for high-value farmland in Italy. The same applies to ownership taxes, ranging from a 0% tax rate on farmland in Finland to over 15% in the southern EU countries.

Neither low taxes for farmland ownership and transactions nor entitlements constrain structural change, but they do expose farmland to non-agricultural investors. Low transaction taxes for farmland and SPS entitlements facilitate structural change through the reallocation of agricultural land and entitlements from less productive to more productive farms (e.g. Germany). On the other hand, agricultural land markets in countries with low transaction taxes are more exposed to speculative farmland purchases (and sales) by non-agricultural investors (e.g. Finland). Differentiated farmland ownership taxes for farmers and non-farmers reduce the incentives for long-term, speculative farmland purchases (and sales) by non-agricultural investors, but hinder structural change (e.g. Greece).

CAP subsidies have an impact on land values, but the impact varies substantially across countries and appears relatively modest compared with other factors, especially where land prices are high. CAP subsidies appear to affect land sales prices in the EUSCs. Still, their relative importance seems limited compared with other drivers. Generally, the lower the land price, the higher is the impact of CAP policies in this respect (e.g. in the Nordic regions in Finland and Sweden). In countries such as the Netherlands and Ireland, where land prices are very high or are rapidly increasing, factors other than CAP policies appear to have a greater bearing.

4.3 Implementation of the SPS

The EU member states could choose among three SPS implementation models: the historical, regional and hybrid model. Under the historical model, the SPS payment is farm-specific and equals the support the farm received in the reference period. This is the most common SPS model in the EUSCs. Under the regional model, an equal per-hectare payment is granted to all farms in the region.

Concerns about the redistribution of subsidies were by far the most compelling factor for the EUSCs that selected the historical model over the regional one. A major motivation for England, Finland and Germany in deciding to apply the dynamic hybrid model instead of directly implementing the regional one was to smooth the adjustment of the farming sector over time. In all cases, receipt of the full SPS support is conditioned on the fulfilment of cross-compliance requirements. More precisely, a farmer receiving SPS support must respect statutory management requirements and maintain land in good agricultural and environmental condition.

None of the EUSCs implemented the purely regional model. The comparative insights are therefore based on contrasting the implications of the historical model with the hybrid model.

4.4 Entitlements: Activation, trade and valuation

The share of non-activated entitlements of the total distributed entitlements is low. For most EUSCs, it is less than 3%. The value of non-activated entitlements tends to be lower than the value of activated ones. Non-activated entitlements mainly stem from the absence of eligible area and administrative burdens (Table 9).

The share of activated entitlements tends to be somewhat higher in countries using the hybrid model than in those using the historical one. We find that this might be owing to specific criteria relating to the implementation of the hybrid model (Table 9).

There is a wide variation in the face value of entitlements among and within the EUSCs. This variation seems to be determined by the commodity structure, the level of support provided in the reference period, the SPS model applied and implementation details.

There are large differences among the EUSCs in the restrictions on trading entitlements. EU regulations allow entitlements to be tradable but certain constraints are imposed by the EU. Member states have some flexibility in introducing additional country-specific limitations on entitlement tradability. Spain, Italy and France have the tightest restrictions on entitlement trading (Table 10).

The trade of entitlements is most often conducted directly among farmers, although sometimes market agents or farm organisations play a role. Spain appears to have the most developed entitlement trading system, similar to an auction (Table 11).

There is no informal trading in entitlements, except among family members. An informal entitlement market was not found in any of the EUSCs, because in order to receive payments, entitlement holders need to be identifiable. Unofficial 'trade' may occur among members of the same family, however.

The entitlement market tends to be smaller in regions under the hybrid model compared with the historical model. Under the historical model, trade is likely to be driven by structural change – because the SPS was implemented in 2005–07, but the SPS entitlements were distributed based on land use in 2000–02. With the hybrid model, entitlement trading is driven by a combination of decoupling and the fact that relatively more entitlements were allocated than with the historical model. Structural change is less of an influential factor in the entitlement market under the hybrid model, as entitlements were distributed based on the area used in the first year of the SPS application. Differences in the implementation features of the two SPS models may explain the higher volume of trade with the historical model than with the hybrid one. This is chiefly evident in the short run, which is investigated in this paper (Table 12).

Preliminary evidence suggests that the trade in entitlements is also affected by the functioning of land markets, restrictions on the tradability of entitlements, the availability of an opportunity to consolidate entitlements and the amount of naked land.

Entitlements are most often traded with land. Evidence from the EUSCs shows that with few exceptions, entitlement trades are usually accompanied by land.

Our data show that *the market price for entitlements in most EUSCs is between one and three times the annual face value of the entitlement.* A simple calculation would indicate that with perfect markets and without uncertainty, the entitlement price would be in the range of four to five times the face value if the SPS were to run until 2013 or in the range of ten to twenty if the SPS were to run indefinitely (Table 11).

Several factors may explain the observed gap in the entitlement price between theoretical expectations and empirical evidence: i) uncertainty about the future of the SPS (e.g. modulation and the health check), ii) the additional costs of the SPS (e.g. administrative costs), iii) the taxes and fees imposed on transactions and iv) credit market imperfections. The low market price of the entitlements may also reflect the capitalisation of the SPS into farmland values.

4.5 Impact of SPS implementation

Our theoretical framework and empirical evidence in the literature suggest that the impact of the SPS on land markets depends on several factors, including the SPS model applied and specific implementation features, market imperfections, transaction costs, market structure and other policies.

On average, the impact on land markets of the switch to the SPS appears to have been weak and it has not led to lower capitalisation than under coupled policies, although there has been variation among the EUSCs and regions. Preliminary evidence presented in this paper indicates that on average the impact has been limited. We do not observe major declines in land prices with the shift to decoupled policies, which implies that there are no significant reductions in the capitalisation of support.

The introduction of the SPS appears to have had a larger impact on land rents than on farmland sales prices. The net effect on land values also depends on the rate of SPS capitalisation into land values and on the relative significance of the SPS compared with other drivers of land values. The empirical evidence from this paper implies that the relative weight of the SPS in determining farmland prices against that of other drivers of land values is higher for rents than for sales prices.

Preliminary evidence reveals that the historical model leads to lower capitalisation of the SPS into land values than the regional or hybrid models. In countries with the hybrid model, capitalisation appears to be driven by the low amount of naked land. In countries with the historical model, the impact of the SPS appears to be substantially weaker. Where SPS land capitalisation occurs, the most influential factor tends to be structural change combined with constrained entitlement trading

(most notably in Belgium). In countries such as Greece, there is little activity on the land market and hence there is little capitalisation of the SPS. In Ireland, the possibility to consolidate entitlements has reduced the pressure of the SPS on land markets and SPS land capitalisation appears to be minimal.

We also find that instead of reducing capitalisation, introduction of the SPS appears to have increased capitalisation in the least productive countries. The SPS seems to have put a floor on land values in less productive regions (e.g. in Sweden and parts of the UK). The clearest evidence of the influence of the SPS on land values is higher land values for less fertile land (e.g. grassland). But this finding could also be rooted in the redistribution that came with the hybrid model.

In countries with regulated rental prices, implementation of the SPS seems mainly to affect unofficial markets. In these member states, there is little effect on official prices (since these are regulated), but where regulations lead to the existence of unofficial markets for agricultural land, the SPS tends to increase both rental prices (e.g. Belgium) and volumes on the unofficial market (e.g. Belgium and the Netherlands).

4.6 Distribution of SPS benefits

Landowners tend to benefit more from the hybrid model than from the historical model. More specifically, landowners benefit more under the hybrid model through two channels. The first is the capitalisation of the SPS into land values. This is mostly the case where low amounts of naked land drive up land values. The second channel concerns the implementation features of the hybrid model. Under the hybrid model, the number of entitlements that farmers receive is equal to the total eligible area in the first year of the SPS application. This has enabled some non-farming landowners to obtain entitlements either by cancelling the existing rental contracts and applying for entitlements themselves or by adjusting rental contracts to ensure that entitlements return to them after the contract expires, or by undertaking other similar arrangements.

The distribution of the SPS payments to landowners appears to differ markedly among the EUSCs. From our country studies, it seems that landowners benefit most from the SPS in Finland and Sweden (60-100% of the value of the entitlement) and least in Greece and Ireland (0-10%). In the rest of the countries, the benefits that accrue to landowners from the SPS are in the low to medium range (10-60%).

The distribution of the SPS additionally depends on whether landowners are also farmers, which varies among the EUSCs. As mentioned above, the prevalence of renting land differs greatly among the EUSCs. The evidence in this paper suggests that in Germany, Northern Ireland and Sweden, a substantial share of SPS benefits will be channelled to non-farming landowners. This finding also holds (but to a lesser extent) for England, Finland and Scotland. In the rest of the EUSCs, a lower share of the SPS will go to non-farming landowners, either because renting land is less common or because there is little capitalisation of the SPS into land values (or both). In these countries, farmers appear to gain the largest proportion of the SPS.

4.7 Effects on structural change

It is too early to observe significant effects of the SPS on structural change in agriculture. Structural change is a long-term process, and it is therefore premature to assess the developments observed one or two years since the SPS was introduced. Meanwhile, substantial structural changes related to factors other than the SPS have occurred in agriculture in the last few years. Still, the decoupling of subsidies with the introduction of the SPS has been identified by most country studies as having had a major impact on structural change in agriculture.

The SPS seems to constrain farm exit and increase part-time farming. Evidence from several countries, e.g. Belgium, Finland, Sweden and the UK, suggests that the SPS constrains farm exit. The SPS also appears to increase part-time farming – an effect that seems more pronounced in marginal areas. Part-time farming allows farmers to reduce unprofitable farm activities while still benefiting from the SPS. No significant difference can be identified between the hybrid and historical models in this respect.

The impact of the SPS on hired labour appears small. There is insufficient evidence to identify the effects of the SPS on other agricultural labour developments.

The hybrid model has stimulated (formal) farm entry, unlike the historical model, although it has also given rise to uncertainty on the rental markets. This is because under the hybrid model, the allocation of entitlements is based on land use when the SPS was introduced and not on land use in the reference period. We find some evidence that landowners have started farming in order to gain access to the entitlements. The long-term net impact of these rent-seeking activities on farm structures is unclear. Nevertheless, it has affected the distribution of SPS rents and the market in entitlements in ways that are different from the historical model, where such activities do not appear to have occurred.

The introduction of the SPS has reduced farm credit constraints, especially for short-term credit. An interesting and potentially significant side effect of the SPS has emerged in rural credit markets. Several country studies (e.g. France, Germany, Italy and Spain) confirm that the SPS affects farms' access to credit. If farms receive the subsidies at the beginning of the season, they can use the SPS to pay for inputs directly. If farms receive SPS payments at the end of the season, the SPS subsidies can be used as collateral for bank credit. Because of uncertainty about the future of the SPS, however, it appears that the SPS has no influence on long-term credit. Lenders are not willing to provide longer-term loans by accepting future SPS payments as collateral.

4.8 Effects of changes in the SPS models on land values

None of the EUSCs implemented a purely regional model. Most of the EUSCs have applied the historical model and some the dynamic hybrid model, which will gradually be replaced by the regional model.

The key characteristic of the regional model is that it equalises the face value of all entitlements. The effect of the shift to the regional model will be determined by three critical features: i) whether new entitlements are allocated, ii) the redistribution of subsidies among regions and iii) how landowners are treated with respect to access to the entitlements.

The regional model may lead to changes in relative land prices among regions. The regional model redistributes subsidies among regions, which is expected to lead to higher prices in less productive regions and lower prices in more productive ones. The effect is expected to be more marked in those regions currently applying the historical model. Under the hybrid model, a share of the payments has already been redistributed.

The implementation details of the regional model will largely determine whether the shift to the regional model will increase the capitalisation of the SPS compared with current SPS models. Among other things, this will depend on whether the number of entitlements increase or stay at the present level and how much non-farming landowners' access to entitlements is regulated and the rules enforced.

Yet if the total number of entitlements allocated is affected by the policy changes, the upward pressure on land prices will continue to be stronger in those countries that have implemented the hybrid model.

Frictions between farmers and landowners are expected to intensify with the shift to the regional model. The chief factors in this regard will be the extent to which the access to entitlements of non-farming landowners is regulated and enforced, and the extent to which newly allocated entitlements (if any) are based on current or past land use.

The change in models may have an impact on the levels of uncertainty and transparency in the entitlement market. If the shift to the regional model provokes uncertainty among farmers, it will constrain entitlement markets and may induce more land capitalisation. On the other hand, the shift to the regional model may increase transparency in the entitlement market, as all entitlements will have the same face value.

5. LIMITATIONS OF THE ANALYSIS

The results reported in the present paper are subject to certain limitations. First, as in any empirical analysis, one should keep in mind data limitations when interpreting the results. In particular, data on land transactions are scarce for the period after the SPS was implemented. The rather short time span since the implementation of the SPS combined with the varying quality of the available data does not allow us to perform a consistent econometric analysis. In addition, farmland markets are only marginally covered in national statistical data. For example, in several countries uniform databases for the land market are still to be established (e.g. the land cadastre in Greece).

Second, the global food markets have simultaneously undergone major changes, such as a rise in world prices for agricultural commodities. Rising energy prices have increased competition for farmland from the bio-energy sector. These factors reduce the ability to isolate the impact of the SPS on agricultural land markets.

Third, the qualitative analysis performed in the present paper does not enable us to assess confidence intervals nor does it allow us to perform sensitivity analysis on the results or checks on statistical robustness. Although we have attempted to systematically verify all the input data and prove our findings using several alternative sources of information, this cannot replace statistical robustness checks. This is a promising avenue for future work, when more and better quality data become available.

Fourth, the results for farmland sales prices are not directly comparable with the results for farmland rental prices. On the one hand, it is rather difficult to identify the impact of the SPS on land sales prices, because these are more strongly driven by non-agricultural factors and market expectations are more important. For land rents, this problem is less acute. On the other hand, rental markets for agricultural land are more regulated than sales markets are and in rigid markets, the contracts tend to be of a longer duration. Rental contract regulations may delay or mitigate the capitalisation of the SPS into higher land rents than observed in rental market data.

Moreover, if the previous area payments introduced under the 1992 CAP reform and under Agenda 2000 were already capitalised into land values, then the capitalisation of the SPS may be difficult to observe because of biased counterfactual. The empirical literature estimating the impact of previous subsidies on land values is scarce but in general it tends to find that the previous area payments do affect land values (Duvivier et al., 2005; Patton et al., 2008). This implies that the SPS may be capitalised into land values even in the case when land prices remain stable after the introduction of the SPS. However, to be able to quantify a precise rate of the capitalization of the SPS other factors which may affect land values also need to be accounted for, alongside the previous area payments. Further work would be needed to explore this and to obtain an unbiased effect of the SPS.

REFERENCES

- Abler, D. (2001), "Elasticities of Substitution and Factor Supply Elasticities in Canadian, Mexican and United States Agriculture: A Review of Past Studies", *OECD Market Effects of Crop Support Measures*, OECD, Paris, pp. 57-88.
- Alliance Environnement (2007), *Evaluation of the Application of Cross-compliance as Foreseen under Regulation 1782/2003*, Study prepared for DG Agriculture, Alliance Environnement, Groupement Européen d'Intérêt Economique (retrieved from http://ec.europa.eu/agriculture/eval/reports/cross_compliance/index_en.htm).
- Alston, J.M. (2007), "Benefits and Beneficiaries from US Farm Subsidies", *The 2007 Farm Bill and Beyond*, AEI Agricultural Policy Series, American Enterprise Institute (retrieved from <http://www.aei.org/farmbill>).
- Alston, J.M. and J.S. James (2002), "The Incidence of Agricultural Policy", in B.L. Gardner and G.C. Rausser (eds), *Handbook of Agricultural Economics*, Vol. 2B, Amsterdam: Elsevier, pp. 1689-1749.
- Balman, A. (1999), "Path Dependence and the Structural Development of Family Farm Dominated Regions", paper presented at the "IX European Conference of Agricultural Economists", Warsaw, 24-28 August.
- Barnard, C.H., R. Nehring, J. Ryan and R. Collender (2001), "Higher Cropland Value from Farm Program Payments: Who Gains?", *Agricultural Outlook*, Special Edition, November, pp. 26-30.
- Barnard, C.H., G. Whittaker, D. Westenbarger and M. Ahearn (1997), "Evidence of capitalisation of direct government payments into US cropland values", *American Journal of Agricultural Economics*, Vol. 79, No. 5, pp. 1642-1650.
- Barry, P.J. and L.J. Robinson (2001), "Agricultural Finance: Credit, Credit Constraints and Consequences", in B.L. Gardner and G.C. Rausser, (eds), *Handbook of Agricultural Economics*, Amsterdam: Elsevier, pp. 513-571.
- Bartolini, F., V. Gallerani, M. Raggi and D. Viaggi (2008), "Effectiveness of Cross-Compliance under Asymmetric Information and Differentiated Compliance Constraints", paper presented at the XII EAAE Congress: "People, Food and Environments: Global trends and European Strategies", Ghent (Belgium), 25-29 August.
- Bayerisches Staatsministerium für Landwirtschaft und Forsten (BayStMLF) (2006), *Bayerischer Agrarbericht 2006*, BayStMLF, München.
- Bierlen, R., L.D. Parsch, B.L. Dixon and B.L. Ahrendsen (2000), "The 1996 FAIR Act: Measuring the Impacts on Land Leasing", *Review of Agricultural Economics*, Vol. 22, No. 2, pp. 336-354.
- Binswanger, H. and M. Rosenzweig (1986), "Behavioral and Material Determinants of Production Relations in Agriculture", *Journal of Development Studies*, Vol. 22, No. 3, pp. 503-39.
- Blancard, S., J.P. Boussemart, W. Briec and K. Kerstens (2006), "Short- and Long-Run Credit Constraints in French Agriculture: A Directional Distance Function Framework

- Using Expenditure-Constrained Profit Functions”, *American Journal of Agricultural Economics*, Vol. 88, No. 2, pp. 351-364.
- Bodenverwertungs- und -verwaltungs GmbH (BVVG) (2008), Ergebnisse (retrieved from <http://www.bvvg.de/INTERNET/internet.nsf/vBroInfo/iErgebnisse?Opendocument>).
- Bortolozzo, D. (2008), “Il mercato parallelo dei terreni con titoli PAC”, *Terra e Vita*, Vol. 3, pp. 89-94.
- Boussemart J.P., J.B. Butault, N. Delame, E. Matvejev and J.M. Rousselle (2007), “Economies of Scale and Optimal Farm Size in the Estonian Dairy Sector”, in S. Mann, *Causes and Impacts of Agricultural Structures*, New York: Nova Science Publishers, pp. 183-200.
- Bullock, D.S. and K. Salhofer (2003), “Judging Agricultural Policies: A Survey”, *Agricultural Economics*, Vol. 28, No. 3, pp. 225-243.
- Cahill, S.A. (1997), “Calculating the Rate of Decoupling for Crops under CAP/Oilseeds Reform”, *Journal of Agricultural Economics*, Vol. 48, No. 3, pp. 349-378.
- Casali, M. (2008), “Il terreno tiene come investimento complice l’incremento dei cereali”, *Terra e Vita*, Vol. 3, pp. 8-9.
- Castle, E.N. and I. Hoch (1982), “Farm Real Estate Price Components, 1920–78”, *American Journal of Agricultural Economics*, Vol. 64, pp. 8–18.
- Chambers, R.G. and T.T. Phipps (1988), “Accumulation and Rental Behavior in the Market for Farmland”, *Western Journal of Agricultural Economics*, Vol. 13, No. 2, pp. 294-306.
- Chatellier, V., H. Guyomard, L. Latruffe and F. Levert (2007), “Agricultural Incomes in the EU and Public Policies”, paper presented at the Expert Workshop on “Income and Factor Markets under 2003 CAP Reform”, IPTS, Seville, 28-29 June.
- Chau, N.H. and H. de Gorter (2005), “Disentangling the Consequences of Direct Payment Schemes in Agriculture on Fixed Costs, Exit Decisions, and Output”, *American Journal of Agricultural Economics*, Vol. 87, pp. 1174-1181.
- Chavas, J.P. and A. Thomas (1999), “A Dynamic Analysis of Land Prices”, *American Journal of Agricultural Economics*, Vol. 81, No. 4, pp. 772-784.
- Ciaian, P. and J.F.M. Swinnen (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, No. 4, pp. 799-815.
- (2007), *Credit Market Imperfections and the Distribution of Policy Rents: The Common Agricultural Policy in the New EU member states*, LICOS Discussion Paper 183/2007, LICOS, University of Leuven.
- (2009), “Credit Market Imperfections and the Distribution of Policy Rents”, *American Journal of Agricultural Economics*, Vol. 91, No. 4, pp. 1124-1139.
- Ciaian, P., D. Kancs and J.F.M. Swinnen (2008), *Static and Dynamic Distributional Effects of Decoupled Payments: Single Farm Payments in the European Union*, LICOS Discussion Paper 207/2008, LICOS, University of Leuven.
- Ciaian, P., D. Kancs and J. Michalek (2008), *SPS Capitalization into Land Value: Generalized Propensity Score Evidence from the EU*, LICOS Discussion Paper, LICOS, University of Leuven.

- Ciaian, P. and D. Kancs (2009), "The Capitalisation of Area Payments into Farmland Rents: Theory and Evidence from the New EU Member States." EERI Research Paper Series No 2009/4, Economics and Econometrics Research Institute.
- Clark, J.S., M. Fulton, and J.T. Scott, Jr. (1993), "The Inconsistency of Land Values, Land Rents and Capitalization Formulas", *American Journal of Agricultural Economics*, Vol. 75, pp. 147-155.
- Courleux, F., H. Guyomard, F. Levert and L. Piet (2008), *How the EU Single Farm Payment should be Modelled: Lump-sum Transfers, Area Payments or... What else?*, SMART-LERECO Working Paper No. 08-01, INRA, Rennes, version 27 May 2008.
- Deininger, K. and G. Feder (2001), "Land Institutions and Land Markets", in B.L. Gardner and G.C. Rausser (eds), *Handbook of Agricultural Economics*, Amsterdam: Elsevier, pp. 288-331.
- Department of Agriculture and Rural Development (DARD) (2008), *Statistical Review of Northern Ireland Agriculture 2007*, DARD, Belfast.
- Department for Environment, Food and Rural Affairs (Defra) (2006), *Guide to the Regulatory Reform (Agricultural Tenancies) (England and Wales) Order 2006*, Defra, London.
- (2008), *Agriculture in the UK 2007*, Defra, London.
- Deutscher Bauernverband (DBV) (1999–2008), *Situationsbericht, Trends und Fakten zur Landwirtschaft* (verschiedene Jahrgänge), DBV, Berlin (retrieved from <http://www.situationsbericht.de>).
- (2007), *Situationsbericht 2008*, DBV, Berlin, December.
- Dewbre, J., J. Anton and W. Thompson (2001), "The transfer efficiency and trade effects of direct payments", *American Journal of Agricultural Economics*, Vol. 83, No. 5, pp. 1204-1214.
- Douarin, E., A. Bailey, S. Davidova, M. Gorton and L. Latruffe (2007), *Structural, Location and Human Capital Determinants of Farmers' Response to Decoupled Payments*, Paper prepared for the European Commission's FP6 IDEMA project (Deliverable 14), Project coordinator: Swedish Institute for Food and Agricultural Economics, Lund.
- Duvivier, D., F. Gaspart and B.H. de Frahan (2005), "A Panel Data Analysis of the Determinants of Farmland Price: An Application to the Effects of the 1992 CAP Reform in Belgium", paper presented at the XIth EAAE Congress on "The Future of Rural Europe in the Global Agri-Food System", Copenhagen, 23-27 August.
- European Commission, *The Agricultural Situation in the European Union*, annual report by DG AGRI, Brussels, various years.
- (2007a), *Agriculture in the European Union – Statistical and economic information 2007*, Brussels.
- (2007b), *36th Financial Report from the Commission to the European Parliament and the Council on the European Agricultural Guidance and Guarantee Fund*, Guarantee Section, 2006 Financial Year, Brussels.
- (2007c), *Study to Assess the Administrative Burden on Farms Arising from the CAP*, DG AGRI, Brussels.
- European Council (1991), Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources, OJ L 375, 31.12.1991.

- Eurostat (2000), *Agricultural Land Prices and Rents in the EU, 1977-1998*, Theme 5 Series C, Eurostat, Luxembourg.
- Eurostat (2008), *Europe in figures – Eurostat yearbook 2008*, Luxembourg: Office for Official Publications of the European Communities.
- Featherstone, A.M. and T.G. Baker (1987), “An Examination of Farm Sector Real Asset Dynamics: 1910-1985”, *American Journal of Agricultural Economics*, Vol. 69 pp. 532-546.
- Färe, R., S. Grosskopf and H. Lee (1990), “A nonparametric approach to expenditure-constrained profit maximization”, *American Journal of Agricultural Economics*, Vol. 72, No. 3, pp. 574-581.
- Feldstein, M. (1980), “Inflation, Portfolio Choice and the Prices of Land and Corporate Stocks”, *American Journal of Agricultural Economics*, Vol. 62, No. 4, pp. 532-546.
- Floyd, J.E. (1965), “The Effects of Farm Price Supports on Returns to Land and Labour in Agriculture”, *Journal of Political Economy*, Vol. 73, pp. 148-158.
- Food and Agriculture Organisation (FAO) (2008), “Growing Demand on Agriculture and Rising Prices of Commodities; An Opportunity for Smallholders in Low-Income, Agricultural-based Countries?”, paper prepared by the Trade and Markets and Agricultural Development Economics Divisions of the FAO for the Round Table organised during the 31st Session of IFAD’s Governing Council, 14 February.
- Gallerani, V., G. Zanni, and D. Viaggi, (2004), *Manuale di Estimo*, Milano: McGraw-Hill.
- Gardner, B.L. (1983), “Efficient Redistribution through Commodity Markets”, *American Journal of Agricultural Economics*, Vol. 65, No. 2, pp. 225-234.
- (2002), *US Commodity Policies and Land Prices*, WP02-02, Department of Agricultural and Resource Economics, University of Maryland.
- Gellynck, X., G. Van Huylenbroeck, V. Vandermeulen, K. Bervoets, G. Allart, H. Leinfelder, D. Verhoestraete, J. Van Orshoven, K. Bomans, H. Gullinck, G. Vloebergh, G. Laureys, J. De Greef and P. Wuillaume, (2006-07), *Analyse van de huidige en toekomstige ruimtebehoefte voor land- en tuinbouw en de toekomstige ruimtelijke ontwikkelingen binnen de land- en tuinbouw*, Report for the Flemish Government, Department Landbouw en Visserij, Afdeling Monitoring en Studie, Katholieke Universiteit Leuven, Universiteit Gent and Studiegroep Omgeving.
- Goodwin, B.K. and A.K. Mishra (2002), *Are ‘Decoupled’ Farm Program Payments Really Decoupled? An Empirical Evaluation*, Department of Agricultural, Environmental, and Development Economics, Ohio State University, Working Paper, Columbus (retrieved from <http://departments.agri.huji.ac.il/economics/kenes-goodwin2.pdf>).
- Goodwin, B.K., A.K. Mishra and F.N. Ortalo-Magné (2003), “What’s Wrong with our Models of Agricultural Land Value?”, *American Journal of Agricultural Economics*, Vol. 85, pp. 744-752.
- Goodwin, B.K., A.K. Mishra and F. Ortalo-Magné (2005), “Landowners’ Riches: The Distribution of Agricultural Subsidies”, retrieved from http://www4.ncsu.edu/~bkgoodwi/papers/lr_ces.pdf.
- Goodwin, B.K. and F.N. Ortalo-Magné (1992), “The Capitalisation of Wheat Subsidies into Agricultural Land Value”, *Canadian Journal of Agricultural Economics*, Vol. 40, pp. 37-54.
- Grandjean, M., Y. Hanin, and V. Rousseaux (2006), “Etat de l’environnement Wallon: Occupation du territoire en Région Wallonn, Territ 2: Terres urbanisées”, Dossier

scientifique réalisé dans le cadre de l'élaboration du Rapport analytique 2006-2007 sur l'Etat de l'Environnement Wallon, Service Public de Wallonie (retrieved from <http://environnement.wallonie.be/eew/rapport/Dsci.aspx>).

- Guyomard, H., C. Le Mouél and A. Gohin (2004), "Impacts of alternative agricultural income support schemes on multiple policy goals", *European Review of Agricultural Economics*, Vol. 31, No. 2, pp. 125-148.
- Hennessy, D.A. (1998), "The Production Effects of Agricultural Income Support Policies under Uncertainty", *American Journal of Agricultural Economics*, Vol. 80, pp. 46-57.
- Hertel, T.W. (1989), "Negotiating reductions in agricultural support: Implications of technology and factor mobility", *American Journal of Agricultural Economics*, Vol. 71, No. 3, pp. 559-573.
- Hoek, J.M. van den and J. Luijt (1999), *Ontwikkelingen rond pacht*, LEI, The Hague.
- Innes, R. (2003), "Stop and Go Agricultural Policies with a Land Market", *American Journal of Agricultural Economics*, Vol. 85, No. 1, pp. 198-215.
- Istituto Nazionale di Economia Agraria (INEA) (2008), "I Risultati dell'Indagine 2003-2006", INEA, Rome (retrieved from http://www.inea.it/progetti/mercato_f.cfm).
- Jayet, P.A., E. Debove, W. Kleinhanss, B. Küpker, L. Judez and A. Xepapadeas (2007), "Land market & Genedec", DG AGRI, European Commission, Brussels, 5 March.
- Joly, L. (2003), "Schenkingen, verdelingen en erfenissen", in R. Gotzen (ed.), *Wetgeving in de land -en tuinbouw*, BB Consult v.z.w, Leuven.
- Just, R.E. and J.A. Miranowski (1993), "Understanding Farmland Price Changes", *American Journal of Agricultural Economics*, Vol. 75, No. 1, pp. 156-168.
- Kilian, S. and K. Salhofer (2008), "Single Payments of the CAP: Where do the Rents Go?", *Agricultural Economics Review*, Vol. 9, No. 2.
- King, D.A. and J.A. Sinden (1994), "Price Formation in Farmland Markets", *Land Economics*, Vol. 70, No. 1, pp. 38-52.
- Kirwan, B. (2005), *The Incidence of US Agricultural Subsidies on Farmland Rental Rates*, Working Paper 05-04, Department of Agricultural and Resource Economics, University of Maryland.
- Latruffe, L. and C. Le Mouél (2006), *How and to What Extent Support to Agriculture Affect Farmland Markets and Prices: A Literature Review*, INRA Report No. JADE 34145 (prepared for the OECD), Centre de Recherche de Rennes, Rennes Cedex.
- Latruffe, L., T. Doucha, C. Le Mouél, T. Medonos and V. Voltr (2006), "Capitalisation of Government Support in Agricultural Land Prices in the Czech Republic", paper presented for the 93rd EAAE Seminar, Prague, 22-23 September.
- Le Goffe, P. and J. Salanié, (2005), "Le droit d'épandage a-t-il un prix ? Mesure sur le marché foncier", *Cahiers d'Economie et Sociologie Rurales*, Vol. 77, pp. 36-64.
- Lence, S.H. (2001), "Farmland Prices in the Presence of Transaction Costs: A Cautionary Note", *American Journal of Agricultural Economics*, Vol. 83, No. 4, pp. 985-992.
- Lence, S.H. and D.J. Miller (1999), "Transaction Costs and the Present Value Model of Farmland: Iowa, 1900-1994", *American Journal of Agricultural Economics*, Vol. 81, No. 2, pp. 257-272.

- Lence, S.H. and A.K. Mishra (2003), "The Impacts of Different Farm Programmes on Cash Rents", *American Journal of Agricultural Economics*, Vol. 85, No. 3, pp. 753-761.
- Lianos, T.P. and D. Parliarou (1987), "Land Tenure in Greek Agriculture", *Land Economics*, Vol. 63, No. 3, pp. 237-148.
- Munch, W. (2007), "Land Price Effects of Declining Support", presentation at the European Commission's DG AGRI workshop, Brussels.
- Nash, J.F. (1950), "The Bargaining Problem", *Econometrica*, Vol. 18, No. 2, April, pp. 155-62.
- OECD (2000), *A Matrix Approach to Evaluating Policy: Preliminary Findings from Pem Pilot Studies of Crop Policy in the EU, the US, Canada and Mexico*, OECD, Paris.
- (2001), *Decoupling: A Conceptual Overview*, OECD, Paris.
- (2003), *OECD-FAO Agricultural Outlook*, OECD, Paris.
- (2005), *A Review of Empirical Studies of the Acreage and Production Response to US Production Flexibility Contract Payments under the Fair Act and Related Payments under Supplementary Legislation*, OECD, Paris.
- (2007), *Agricultural support, farmland values and sectoral adjustment: The implications for policy reform*, AGR/CA/APM(2006)19/final, OECD, Paris.
- Patton, M., P. Kostov, S. McErlean, and J. Moss. (2008), "Assessing the Influence of Direct Payments on the Rental Value of Agricultural Land", *Food Policy*, Vol. 33, pp. 397-405.
- Plantinga, A.J., R.N. Lubowski and R.N. Stavins (2002), "The Effects of Potential Land Development on Agricultural Land Prices", *Journal of Urban Economics*, Vol. 52, No. 3, pp. 561-581.
- Pokrivcak, J., P. Ciaian, and L. Bartová (2004), "Agricultural Economics and the Common Agricultural Policy", in B.S. Sergi and W.T. Bagatelas (eds., *The Slovak Economy and EU Membership*, Bratislava: Iura Edition, pp. 253-288.
- Rainey, R.L., B.L. Dixon, B.L. Ahrendsen, L.D. Parsch and R.W. Bierlen (2005), "Arkansas Landlord Selection of Land-Leasing Contract Type and Terms", *International Food and Agribusiness Management Review*, Vol. 8, No. 1, pp. 1-19.
- Ravenscroft, N., R. Gibbard and S. Markwell (1998), *Private Sector Tenancy Arrangements in Europe*, Vol. III, position paper, FAO and School of Management Studies for the Service Sector, University of Surrey.
- Roberts, M.J., B. Kirwan and J. Hopkins (2003), "The Incidence of Government Program Payments on Land Rents: The Challenges of Identification", *American Journal of Agricultural Economics*, Vol. 85, pp. 762-769.
- Robinson, L. and J.L. Flora (2003), "The Social Capital Paradigm: Bridging across Disciplines", *American Journal of Agricultural Economics*, Vol. 85, No. 5, pp. 1187-1193.
- Robison, L.J., R.J. Myers and M.E. Siles (2002), "Social Capital and the Terms of Trade for Farmland", *Review of Agricultural Economics*, Vol. 24, No. 1, pp. 44-58.
- Röder, N. and S. Kilian (2008), "Der Markt für Zahlungsansprüche in Deutschland – eine deskriptive Analyse. Berichte über Landwirtschaft", *Band*, Vol. 86, No. 2, pp. 303-321.
- Sahrbacher, C., H. Schnicke, K. Kellermann, K. Happe and M. Brady (2007), *Impacts of decoupling policies in selected regions in Europe*, Paper prepared for the European Commission's FP6 IDEMA project, Project coordinator: Swedish Institute for Food and Agricultural Economics, Lund.

- Salhofer, K. (1996), "Efficient Income Redistribution for a Small Country using Optimal Combined Instruments", *Agricultural Economics*, Vol. 13, pp. 191-199.
- (2001), "Elasticities of Substitution and Factor Supply Elasticities in European Agriculture: A Review of Past Studies", in *OECD Market Effects of Crop Support Measures*, OECD, Paris, pp. 89-119.
- SCENAR 2020 (2006), *Scenario Study on Agriculture and the Rural World*, DG AGRI, European Commission, Brussels.
- Shaik, S., J.A. Atwood and G.A. Helmers (2005), "The Evolution of Farm Programs and their Contribution to Agricultural Land Values", *American Journal of Agricultural Economics*, Vol. 87, No. 5, pp. 1190-1197.
- Siegel, S. and L.E. Fouraker (1960), *Bargaining and Group Decision Making*, New York: McGraw-Hill Book Co., Inc.
- Siles, M., L. Robison, B. Johnson, G. Linne and D. Beveridge (2000), "Farmland Exchanges: Selection of Trading Partners, Terms of Trade, and Social Capital", *Journal of the American Society of Farm Managers and Rural Appraisers*, annual issue, pp. 127-140.
- Statistisches Bundesamt (2006), Fachserie 3. Reihe 2.4. Land- und Forstwirtschaft, Fischerei, Kaufwerte für landwirtschaftliche Grundstücke, Wiesbaden.
- Sumner, D.A. and C.A. Wolf (1996), "Quotas without Supply Control: Effects of Dairy Quota Policy in California", *American Journal of Agricultural Economics*, Vol. 78, pp. 354-66.
- Swinnen, J.F.M. (1999), "Political Economy of Land Reform Choices in Central and Eastern Europe", *Economics of Transition*, Vol. 7, No. 3, pp. 637-664.
- (2002), "Political Reforms, Rural Crises, and Land Tenure in Western Europe", *Food Policy*, Vol. 27, No. 4, pp. 371-394.
- Swinnen, J.F.M., P. Ciaian and D. Kancs (2008), *Study on the functioning of land markets in the EU Member States under the influence of measures applied under the Common Agricultural Policy*, Centre for European Policy Studies (CEPS)
- Swinnen, J.F.M. and L. Vranken (2007), *Transitional Restrictions maintained by New Member States with regard to the Acquisition of Agricultural Real Estate*, study prepared for DG MARKT, European Commission, Brussels.
- Taylor, M.R. and G.W. Brester (2005), "Noncash Income Transfers and Agricultural Land Values", *Review of Agricultural Economics*, Vol. 27, No. 4, pp. 526-541.
- Traill, W.B. (1980), "Land Value and Rents: The Gains and Losses from Farm Price Support Programmes", *Department of Agricultural Economics Bulletin*, 175, University of Manchester.
- Thomson, S. and A. Renwick (2008), *Regional Study for England*, Prepared for the "Study on the Functioning of Land Markets in the EU member states under the Influence of Measures applied under the Common Agricultural Policy", Land Economy & Environment Research, June.
- Tsoodle, L.J., B.B. Golden and A.M. Featherstone (2006), "Factors Influencing Kansas Agricultural Farmland Values", *Land Economics*, Vol. 82, No. 1, pp. 124-139
- Van Der Molen, P. and T. Österberg (1999), *Land Tenure and Land Administration for Social and Economic development in (Western) Europe*, UN/FIG "International Conference on Land Tenure and Cadastral Infrastructures for Sustainable Development", Melbourne, pp. 276-298.

- Van Herck, K. (2008), *Country Study for Belgium*, Prepared for the "Study on the Functioning of Land Markets in the EU member states under the Influence of Measures applied under the Common Agricultural Policy", LICOS, Katholieke Universiteit Leuven, Leuven, 20 June.
- Van Meijl, H. and M. Banse (2007), "The Implications for Land and Labour Markets", paper presented at the "Expert Workshop on Income and Factor Markets under the 2003 CAP Reform", organised by DG AGRI, European Commission and IPTS, Seville, 28-29 June.
- Vlaams informatiecentrum voor land- en tuinbouw (VILT) (2008), "Eensgezindheid over 'Health check' landbouwbeleid", VILT, 29 February.
- Vranken, L. and J.F.M. Swinnen (2006), "Land rental markets in transition: Theory and evidence from Hungary", *World Development*, Vol. 34, No. 3, pp. 481-500.
- Vukina, T. and A. Wossink (2000), "Environmental Policies and Agricultural Land Value: Evidence from the Dutch Nutrient Quota System", *Land Economics*, Vol. 76, No. 3, pp. 413-429.
- Whitaker, J.B. (2006), "The Effects of Decoupled Government Subsidies on Farm Household Well-Being", Department of Economics, Utah State University.
- Whitehead, I., A. Errington, N. Millard and T. Felton (2002), *Economic Evaluation of the Agricultural Tenancies Act 1995*, University of Plymouth.
- Weersink, A., S. Clark, C.G. Turvey and R. Sarker (1999), "The Effect of Agricultural Policy on Farmland Value", *Land Economics*, Vol. 75, No. 3, pp. 425-439.

Table 1. SPS model by member state

		Start of SPS	SPS model selected	Comments
Belgium	<i>Flanders</i>	2005	Historical	–
	<i>Wallonia</i>	2005	Historical	–
Finland		2006	Dynamic hybrid moving to a flat rate	In 2011–13 and 2014–15, the historical farm-specific component will reduce to 70% and 30%, respectively, of the original value; from 2016 onwards it will reduce to 0.
France		2006	Historical	–
Germany		2005	Dynamic hybrid moving to a flat rate	Starting in 2010, the hybrid scheme will gradually transform into a purely regional model by 2013 (see Swinnen, Ciaian and Kancs 2008).
Greece		2006	Historical	–
Ireland		2005	Historical	Farmers can consolidate entitlements (see Swinnen, Ciaian and Kancs 2008).
Italy		2005	Historical	–
Netherlands		2006	Historical	–
Spain		2006	Historical	–
Sweden		2005	Static hybrid (divided into five regions)	–
UK	<i>England</i>	2005	Dynamic hybrid moving to a flat rate	The scheme is gradually transforming into a purely regional model by 2012. In 2005, the regional and historical components were 10% and 90%, respectively. The SPS is categorised by three regional headings: 1) moorland within SDAs, 2) non-moorland within SDAs, and 3) non-SDAs.
	<i>Scotland</i>	2005	Historical	To activate entitlements it was necessary first to enable them and then to claim them. All the entitlements allocated had to be enabled in 2005 and thereafter claimed within three years. Unclaimed entitlements or those not enabled reverted to the national reserve.

Table 1. cont'd

<i>Wales</i>	2005	Historical	-
<i>Northern Ireland</i>	2005	Static hybrid	Of the entitlement, 20% is the regional component (€78 per entitlement) and 80% is the historical component. Farmers were permitted to consolidate the historical component of the entitlement value onto a smaller area to increase the unit value of their entitlements.

Note: SDAs refers to severely disadvantaged areas.

Sources: European Commission (2007a) and Swinnen, Ciaian and Kancs (2008).

Table 2. Some facts about the SPS

	Historical model	Regional model	Hybrid model
Reference period	2000–02	First year of SPS application	Mix of the historical and regional models
Farm reference amounts (total SPS payments established at the farm level)	Direct payments to farms in the reference period	Regional amount calculated in the first year of SPS application	Mix of the historical and regional models
Eligible area	Eligible area includes arable land and permanent pasture except areas under permanent crops, forests or areas used for non-agricultural activities.		
Activation of entitlements	SPS entitlements are activated if accompanied by an equal number of eligible hectares.		
Beneficiaries of the SPS	Active farmers with a historical reference (or with inherited entitlements or those from the national reserve) when the SPS was applied by member states	All active farmers using land in the region in the first year of SPS application	All active farmers using land in the region in the first year of SPS application
Number of entitlements	The number of hectares that generated support in the reference period	Total eligible area in the first year of SPS application	Total eligible area in the first year of SPS application
Unit value of entitlements	Individual reference amount divided by the average number of hectares in the reference period (by number of entitlements)	Regional amounts divided among eligible hectares that were declared in the region in the first year of the SPS	Mix of the historical and regional models

Table 2. *cont'd*

Use of eligible area	Originally, the eligible area could be used for any agricultural activity except for permanent crops, fruit and vegetables and non-starch potatoes. The 2007 reform included fruit and vegetables in the SPS, and as of 2008, land covered by fruit and vegetables is eligible for entitlements.	
Unused entitlements	Entitlements left unused for a period of three years revert to the national reserve.	
Tradability of entitlements	In general, entitlements are tradable but certain constraints are imposed by the EU; additionally, each member state has some flexibility to introduce further country-specific restrictions. The rent of entitlements without land is not possible.	
Set-aside entitlements	Set-aside entitlements are based on the reference period. Set-aside entitlements can be activated by designating eligible hectares as set-aside. Set-aside land may be subject to rotation and may be used for non-food production. In 2008, the set-aside rate was set at 0%, i.e. any eligible area can activate the entitlement.	Set-aside obligations are spread across all arable land. The total set-aside area per region remains the same but the set-aside area may differ among individual farmers.
Special entitlements	If farmers do not have land in the reference period but received direct payments for livestock, they are eligible for special entitlements. The entitlements can be activated with or without the equivalent number eligible hectares. Activation without land requires the farmer to maintain at least 50% of the agricultural activity exercised in the reference period expressed in livestock units.	
Dairy payments	Dairy payments could be included in the SPS from the start of SPS implementation but no later than 2007.	

Source: European Commission.

Table 3. Studies on the estimated impact of subsidies on farmland values

Study	Dependent/ explanatory variables (country)	Land price elasticity of a 1% increase in subsidies/ returns	Estimated effect of \$1/€1 of subsidy on increase in land value	Estimated value/NPV of subsidies (market return)*	
				r=5%	r=10%
<i>Market return</i>					
Duvivier et al. (2005)	Arable land prices/market return (Belgium)	0.18-0.24	-	-	-
Goodwin et al. (2005)	Land prices/ market return (US)	-	6.4-7.2	0.32-0.36	0.64-0.72
Taylor and Brester (2005)	Land prices/ market return (US)	0.16-0.32	3.85-7.58	0.19-0.38	0.39-0.76
<i>Coupled subsidies</i>					
Goodwin et al. (2003)	Farmland value/LDP (US)	-	6.6	0.33	0.66
Duvivier et al. (2005)	Arable land prices/cereal compensatory payments (Belgium)	0.12-0.47	-	-	-

Table 3. cont'd

Goodwin et al. (2005)	Land price/ LDP (US)	-	8.3-27.4	0.42-1.37	0.83-2.74
Latruffe et al. (2006)	Land price/direct payments (area or animal payments) (Czech Rep.)	0.13	-	-	-
Goodwin et al. (2003)	Farmland value/ disaster-relief payments (US)	-	4.7	0.24	0.47
<i>Decoupled subsidies</i>					
Goodwin et al. (2003)	Farmland value/ AMTA (PFC) payments (US)	-	4.9	0.25	0.49
Goodwin et al. (2005)	Land price/ AMTA (PFC) (US)	-	3.7-4.9	0.19-0.25	0.37-0.49
<i>All subsidies</i>					
Barnard et al. (1997)	Cropland prices/ all direct payments received per acre (US)	0.12-0.69	-	-	-

Notes: The values in these columns are calculated by dividing the estimated effect of subsidies/market return on land price by the net present value of subsidies/market return. If the number is equal to one it implies full capitalisation of subsidies into land prices. A value lower than one implies partial capitalisation of subsidies into land prices.

NPV refers to net present value; LDP refers to loan deficiency payments; PFC refers to production flexibility contracts; AMTA refers to agricultural market transition assistance.

Source: Swinnen, Ciaian and Kancs (2008).

Table 4. Studies on the estimated impact of subsidies on farmland rents

Study	Dependent/explanatory variables (country)	Estimated effect of \$1 of subsidy on land value increase
<i>Market return</i>		
Goodwin, Mishra and Ortalo-Magné (2005)	Land rent/market return (US)	0.35
Lence and Mishra (2003)	Land rent/market return (corn revenues and soybean revenues) (US)	0.30-0.38
<i>Coupled subsidies</i>		
Goodwin, Mishra and Ortalo-Magné (2005)	Land rent/LDP (US)	0.83
Lence and Mishra (2003)	Land rent/LDP (US)	-0.24
<i>Decoupled subsidies</i>		
Goodwin, Mishra and Ortalo-Magné (2005)	Land rent/AMTA (PFC) (US)	0.29
Lence and Mishra (2003)	Land rent/PFC (US)	0.71-0.86
Lence and Mishra (2003)	Land rent/MLA (US)	0.84-0.90
<i>All subsidies</i>		
Roberts, Kirwan and Hopkins (2003)	Land rents/all government payments (PFCs + conservation programmes) (US)	0.34-0.41
Kirwan (2005)	Land rents/all government payments (PFCs + conservation programmes) (US)	0.20-0.40

Notes: LDP refers to loan deficiency payments; PFC refers to production flexibility contracts; MLA refers to market loss assistance; AMTA refers to agricultural market transition assistance.

Source: Swinnen, Ciaian and Kancs (2008).

Table 5. Drivers of agricultural land prices in the EUSCs

Drivers	BE	FI	FR	DE	EL	IE	IT	NL	ES	SE	UK
Agricultural commodity prices	+++	+	++	+	+	--	++	+++	+	++	++
Infrastructural expansion	++	0	++ +	+	+	+++	++	++	+++	na	0
Urban pressures	+++	0	++ +	0	-	+++	+	+++	+++	+	+
SPS	+	++	+	0	++	+	+	0	+	+	0
Farm size	++	+	+	+ / 0	0	+	+	+++	--	++	+ / 0
Coupled subsidies	++	-	+	0	+	+	0	0	++	na	0
Informal institutions	0	++	0	0	0	++	0	0	0	+	+
Interest rates	+	0	+	0	+	0	+	na	--	+	0
Agricultural productivity	0	+	+	+	0	+	0	+	++	+	0
Bio-energy	0	0	++	+ / 0	0	0	0	+++	+	+	0
Other subsidies	0	++	0	na	0	+	0	0	+	na	0
Rural development policies	0	++	0	0	0	+	0	0	0	0	0
Taxes	+	0	0	+	0	+	0	0	0	0	+ / + +
Inflation	0	+	0	0	0	0	+		++	na	0
Land sales regulations	0	0	-	0	0	0	0	0	0	na	0
Other factors	+++	+++	++				0			+	++ / +

Notes: +++ = strong increase; + = weak increase; 0 = no change; --- = strong decrease; -- = medium decrease; - = weak decrease

Source: Swinnen, Ciaian and Kancs (2008).

Table 6. Drivers of agricultural land rents in the EU SCs

Drivers	BE	FI	FR	DE	EL	IE	IT	NL	ES	SE	UK
Agricultural commodity prices	++	++	0	++	0	-	++	+++	0	++	++
Infrastructural expansion	+	+	0	++	0	++	0	++	++	0	+
Urban pressures	+	++	0	+	0	0	++	+++	++	0	0
SPS	+	+	0	+	++	++	+	0	+	++	+
Farm size	+	+	0	0	0	0	0	+++	--	+++	0
Coupled subsidies	+	0	0	+	0	+	0	+++	0	na	0
Informal institutions	0	+++	0	0	0	+++	0	0	0	+	0
Interest rates	0	++	0	0	0	+++	0	0	0	+	0
Agricultural productivity	++	0	0	+++ /+	0	0	0	+++	++	++	0
Bio-energy	0	0	0	0	0	0	0	+++	0	+	0
Other subsidies	0	0	0	+ / 0	0	0	0	0	0	+	0
Rural development policies	0	0	0	0	0	0	0	++	0	+	+
Taxes	0	0	0	0	+	0	0		0	0	0
Inflation	0	+	0	+	+	0	0	0	0	na	0
Land rental regulations	++	0	-	0	0	0	0		0	na	0
Other factors		+++							0	+	0

Notes: +++ = strong increase; + = weak increase; 0 = no change; --- = strong decrease; -- = medium decrease; - = weak decrease

Source: Swinnen, Ciaian and Kancs (2008).

Table 7. Sales market regulations in the EUSCs

	Min./max. sales price	Registration tax & real estate tax* (% of land value)	Land use and other regulations & norms
Belgium	None	10-12.5 <i>CI</i>	Farmland-reducing zoning regulations
Finland	None	4* <i>0 on farmland</i>	
France	None	5.09 <i>CI</i>	Some transactions subject to state approval (through SAFER); farmland-reducing zoning regulations
Germany	Max. sales price for long-term tenants in East Germany	3.5 2.6-6.0	Subject to state agency approval
Greece	Min. price	7-9* <i>0 on farmland</i>	-
Ireland	None	9 0	-
Italy	None	11-18** 0.4-0.7	-
Netherlands	None	0 on farmland <i>6 sales tax*</i>	-
Spain	None	6-7 6-15	-
Sweden	None	30 on two-thirds of sales value 0	Purchase permits for sparsely populated areas & legal entity buyers
UK	None	0-4 0	Tenant and community rights to buy in Scotland; strict development control in the UK

* Exemptions for farmers

** Usually calculated on standard values rather than on the price of the transaction

Note: CI refers to differentiated cadastral income.

Source: Swinnen, Ciaian and Kancs (2008).

Table 8. Rental market regulations in the EU SCs

	Min./max. rental price	Min./max. & average tenancy duration (Years)	Other rental market regulations & norms
Belgium	Max. rent	Min. 9/max. 27 (99) <i>Avg. 9</i>	-
Finland	No	Max. 10 <i>Avg. 5-6</i>	-
France	Min. & max. rent	Min. 1/max. 25 <i>Avg. 9 or 18</i>	Inheritable rental contracts, automatically renewed
Germany	No	No <i>Avg. 6-11.5</i>	Subject to state approval
Greece	Min. rent	No <i><4 years</i>	-
Ireland	No	No <i>Avg. 11 months</i>	Conacre rental agreements
Italy	No	No <i>Avg. arable crops: 2-5</i> <i>Avg. fruit crops: 5-10</i>	Possibility of contracting with the assistance of farmer associations
Netherlands	Max. rent	Min. 6 (until 2007) <i>24 in the past; <10 now</i>	-
Spain	No	Min. 5	-
Sweden	No	No <i>Avg. declining towards 1</i>	-
UK	No	In Scotland, for new tenancies under the 2003 Act, a max. of 5 and a min. of 15	<i>Northern Ireland:</i> Conacre rental agreements <i>Scotland:</i> Traditional, short-duration tenancies <i>England:</i> Traditional tenancies & farm business tenancies

Source: Swinnen, Ciaian and Kanacs (2008).

Table 9. Activated and non-activated entitlements and average value of entitlements

		Year	Activated entitlmt	SPS eligible area	No. of dist. entitlmts/ total eligible area	Non- activated entitlmts	Avg. value of entitlmts	
		(No. in 1,000)	(% of UAA)	(% of UAA)	(total eligible area = 100)	(% of dist. entitlmts)	(€/entitlmt)	
Belgium	<i>Flanders</i>	2006	456	73	85	92	6.8	485
	<i>Wallonia</i>	2006	649	86	95	97	6.8	345
Finland		2007	2,327	101	101	102	0.9	209
France		2007	24,202	88	95	95	2.2	246
Germany		2007	16,749	99	110	90	1.1	332
Greece		2006	n.a.	n.a.	54	60	n.a.	n.a.
Ireland		2007	4,219	99	108	95	3.6	309
Italy		2006	n.a.	n.a.	n.a.	n.a.	n.a.	between 58 and 445
Netherlands		2007	1,569	83	105	80	1.5	500
Spain		2007	15,624	62	80.2	78	1.2	223
Sweden		2007	3,109	98	n.a.	n.a.	2.7	211
UK	<i>England</i>	2006– 07	8,126	87	91	n.a.	n.a.	268
	<i>Scotland</i>	2007	4,270	70	72	100	2.4	131
	<i>Northern Ireland</i>	2007	992	98	100	100	2.5	360

* Estimate

Sources: Swinnen, Ciaian and Kanacs (2008).

Table 10. Tradability of entitlements: Country-specific restrictions

Tradability of entitlements	
Belgium	Entitlements became tradable from 2006. Entitlements can be transferred temporarily* or permanently. Entitlements can be transferred between Flanders and Wallonia; however, entitlements can only be activated on a plot in the same region where it was activated the first time.
France	There are no restrictions on trade, but entitlements can only be activated within the <i>département</i> (NUTS 3) where they were first created. There are various specific restrictions (see Swinnen, Ciaian and Kancs 2008). The renting of entitlements with land is not subject to restrictions (but the rental length of the entitlement should equal the rental length of the attached land).
Finland	No specific restrictions.
Germany	Entitlements are tradable within regions.
Greece	Only farmers with agriculture as a secondary activity are subject to restrictions on entitlement transfers. A share of entitlements reverts to the national reserve in transfers: 5% of the transferred entitlements if transferred with the entire holding; 10% if transferred with land or if the transferred entitlements are subject to special conditions; and 30% if transferred without land.
Ireland	No specific restrictions.
Italy	A share of entitlements revert to the national reserve in transfers: In the sale of entitlements with land: 10% reverts to the national reserve; this is reduced to 5% if the entire farm is sold or reduced to 0% if the sale concerns 'set-aside entitlements' or new farmers. In the sale of entitlements without land: 50% in 2005–07 and 30% in 2008 reverted to the national reserve; if the sale concerns a new farmer, the rate is 0%. In 2008, new regulations removed the restrictions applying to the sale of entitlements with or without land.
Netherlands	No specific restrictions.
Spain	A share of entitlements revert to the national reserve in transfers: For professional farmers without land: 15% in 2006–07 and 10% from 2008, but for new farmers the rate is 0%. For non-professional farmers without land: 50% in 2006–07 and 30% from 2008.

Table 10. *cont'd*

	With land: 5% in 2006–07 and 3% from 2008; for new farmers 0%. With the entire farm: 3% from 2008. Sale of all special entitlements: 5% in 2006–07 and 3% from 2008. Sale of entitlements when the land is returned to the owner: 5% in 2006–07 and 3% from 2008.
Sweden	Entitlements are tradable within regions.
UK	Trade is not allowed among countries (or regions within England such as between moorland and other regions).

* Concerning the temporary transfer of entitlements in Belgium, only landowners can temporarily transfer them in the event of a simultaneous rental of the equivalent number of hectares. The transfer of entitlements is limited to the duration of the tenancy. When the rental agreement ends, the entitlements go back to their owner (the landowner). If the tenant does not activate the entitlement in a period of three successive years, the entitlement goes to the national reserve and is lost for both tenant and owner. This link with the tenancy legislation limits the popularity of the temporary transfers, and thus farmers sometimes make a definitive transfer to the tenant and then afterwards the entitlement is transferred back to the original owner. In 2006 and 2007, there were no temporary transfers of entitlements in Wallonia; in 2006, there were 155 transfers in Flanders.

Source: Swinnen, Ciaian and Kancs (2008).

Table 11. Market sales price of entitlements and organisation of the SPS entitlement market

	Year	Market price of entitlement/ average value of entitlement (Average value of entitlement = 1)	Organisation of the SPS entitlement market
Belgium	2006-08	2-3*	Trade occurs directly among farmers; in many cases, the agricultural consultancy organisations assist farmers.
Finland	-	n.a.	Trade occurs directly among farmers; agents or traders do not play a role.
France	2006-07	1-6**	There is no official institution for trading entitlements, but the ministry of agriculture must be notified of a change in owner.
Germany	2007	1.3	Entitlements are traded directly among farmers.
Greece	-	n.a.	The volume of trade is small, mostly taking place among family members.
Ireland	2007	2.5**	Entitlements are traded independently or through agents, who usually charge a fee of 3-5% of the value of the entitlement. The Department of Agriculture, Fisheries and Food must be informed when entitlements are traded, rented or gifted (e.g. through inheritance).
Italy	2007-08	1-3**	The market is not regimented. Often farmers' professional organisations or farm advisers help to match entitlement sellers and buyers. Some support is also given by the Centre of Agricultural Assistance.
Netherlands	2007-08	2.5	Entitlements are mostly traded through agents. No official institution offers a specific market for entitlements. Private marketplaces play a negligible role.

Table 11. cont'd

Spain	2006	n.a.	Trade occurs directly among farmers. There is no official institution for trading entitlements. Farmers inform the ministry of agriculture about the entitlement record. Some private societies have been founded but have low levels of activity (see Swinnen, Ciaian and Kancs 2008).	
Sweden	2006-07	0.8-2.5**	Entitlement trading occurs on the Internet through agricultural societies, private real estate agents and advertisements in farming publications. There is no official market for trading SPS entitlements.	
UK	<i>England</i>	2005-07	0.8-1.5	In England and Scotland, entitlements are traded on the open market, often conducted by auctions or agents on behalf of their clients.
	<i>Scotland</i>	2006	2.4	
		2007	3	
		2008	2.5	
<i>Northern Ireland</i>	-	n.a.	No official institution is involved in the trading of entitlements. The market is very small. The majority of transfers are not on the open market but tend to be transfers within a business (e.g. father to son).	

* In Belgium, agricultural consultancy organisations advise setting a price that is two to three times the value of the entitlement – guidance that is followed by most farmers.

** Estimate.

Source: Swinnen, Ciaian and Kancs (2008).

Table 12. Annual transactions on the entitlement market

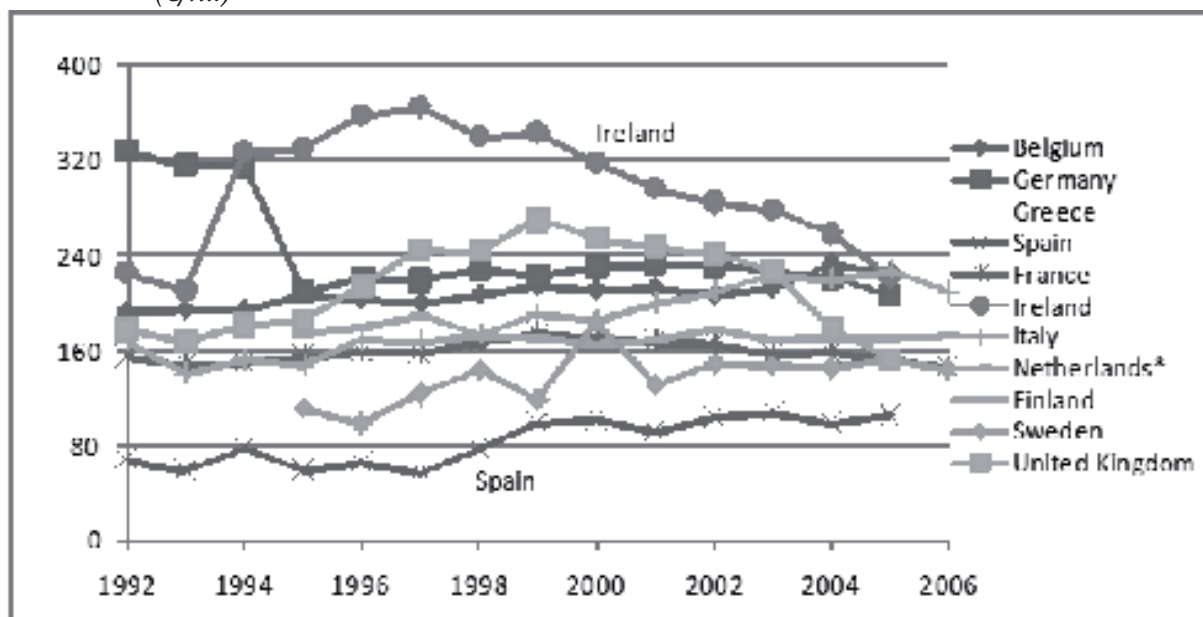
		Type of transaction	Share of traded entitlements among total activated entitlements (%)	
			2006	2007
Belgium**	<i>Flanders</i>	All types	7*	-
	<i>Wallonia</i>	All types	6*	6.6
Finland		Market	-	5.1
France		All types	-	5.4
Germany		Market	1.9	1.3
Greece		Market		Small
Ireland		-	n.a.	n.a.
Italy		-	n.a.	n.a.
Netherlands		Market	3.1	8.1
Spain		Market	3.39	-
Sweden		All types	6.2	11.7
UK	<i>England</i>	Market		Small
	<i>Scotland</i>	-	n.a.	n.a.
	<i>Northern Ireland</i>	All types		Small

* Estimate

** As of 2008, young farmers in Wallonia have been able to obtain higher-value entitlements from the national reserve if their own entitlements have a value lower than the average in the region. To certain extent, this option may increase the trade of entitlements with low values as one may expect that rational young farmers would have incentives to purchase entitlements with a low value and exchange them for higher-value entitlements from the national reserve. Notably, in Flanders, agricultural consultancy organisations have already spotted an increase in the purchases of low-value entitlements by young farmers, as they could replace them with higher-value entitlements from 2007.

Source: Swinnen, Ciaian and Kanacs (2008).

Figure 1. Evolution of real rental prices for agricultural land in the EUSCs, 1992–2006 (€/ha)

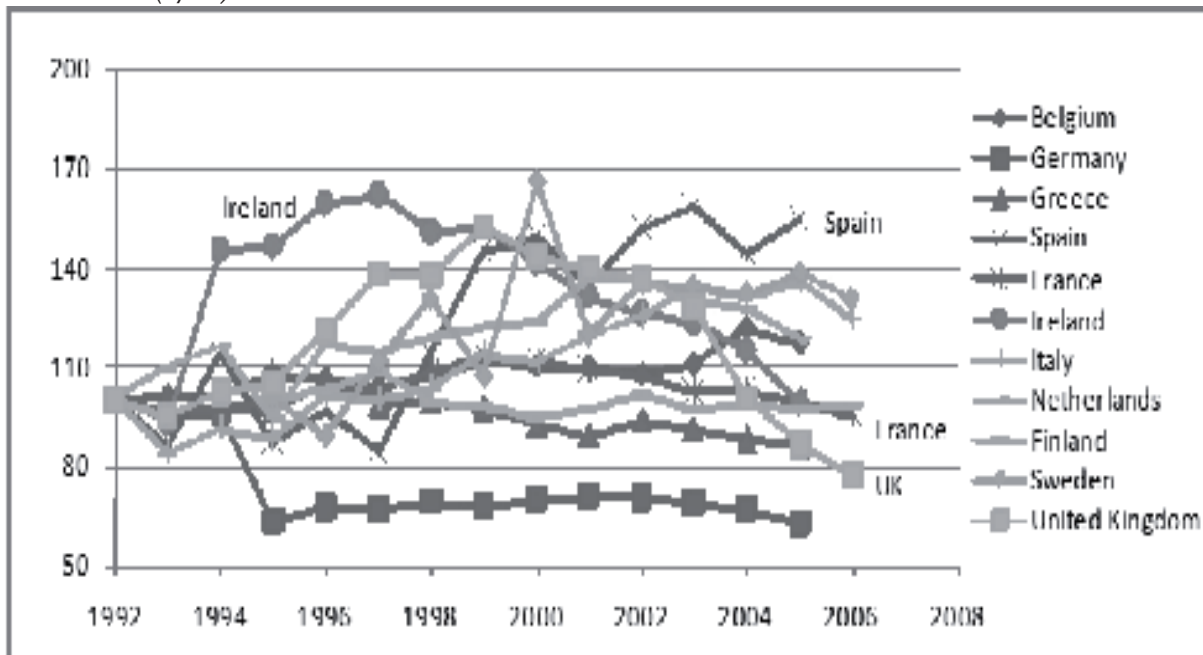


* Not in the figure

Notes: For 1992–96, GDP deflator for Germany, OECD; for 1997–2007, harmonised indices of consumer prices, euro area, Eurostat.

Source: Own calculations based on FADN (2008).

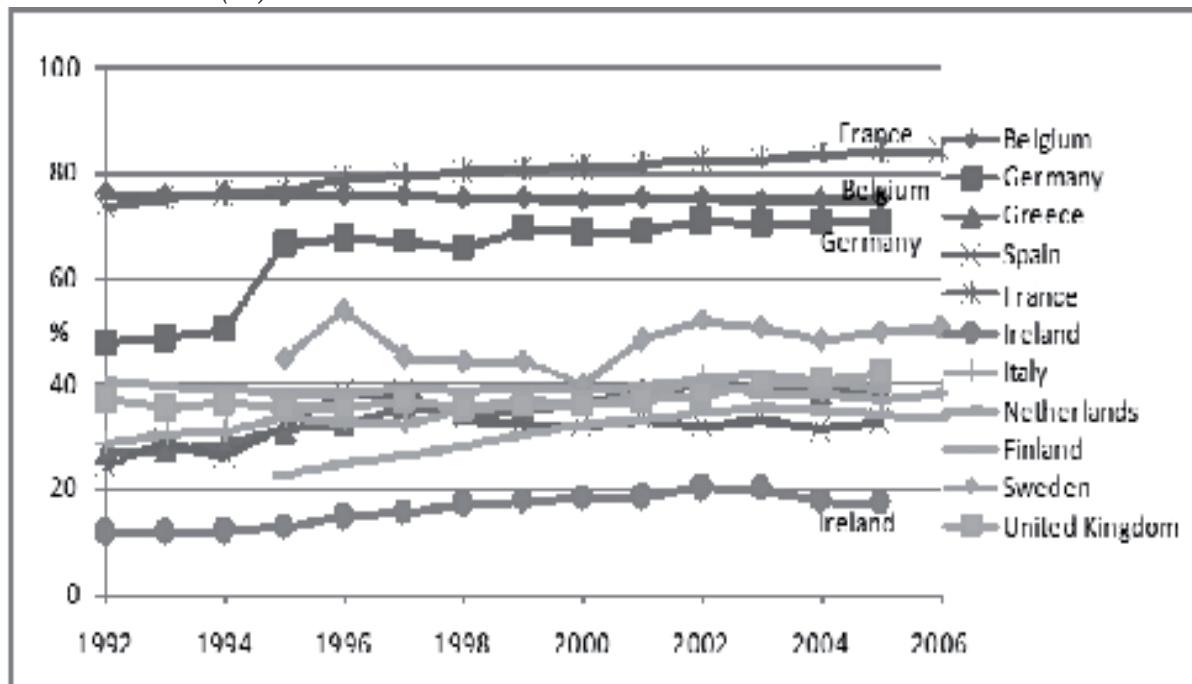
Figure 2. Evolution of rental price indices for agricultural land in the EUSCs, 1992–2007 (€/ha)



Notes: For 19792–96, GDP deflator for Germany, OECD; for 1997–2007, harmonised indices of consumer prices, euro area, Eurostat.

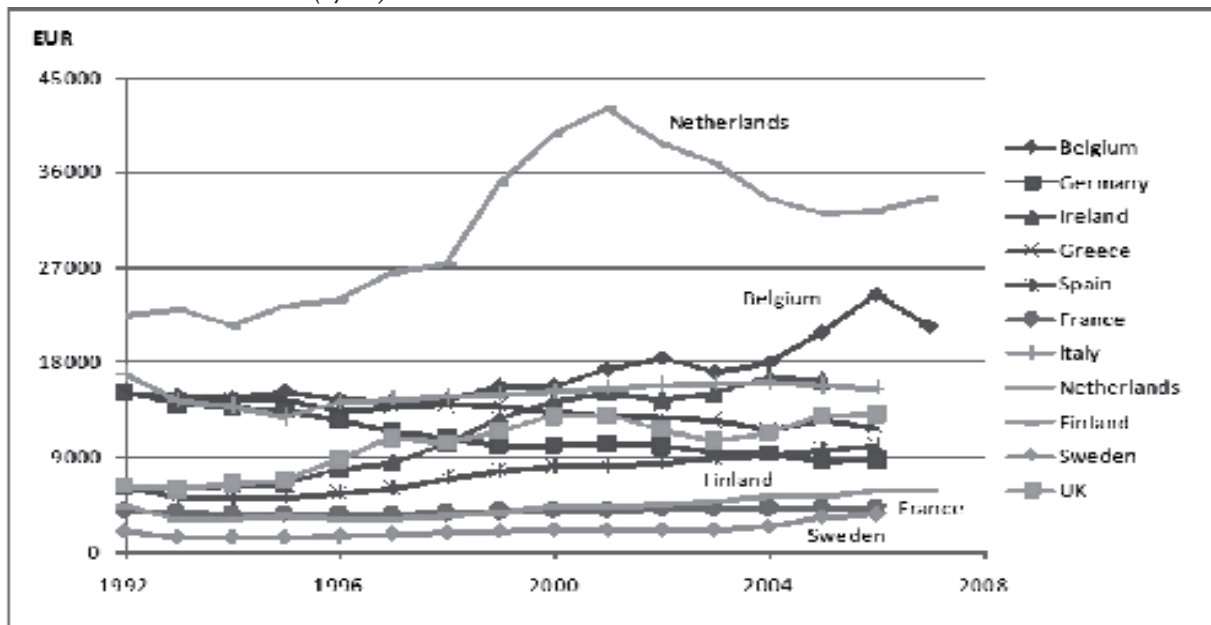
Source: Own calculations based on FADN (2008).

Figure 3. Evolution of the rented share of the total agricultural area in the EUSCs, 1992–2006 (%)



Source: Own calculations based on FADN (2008).

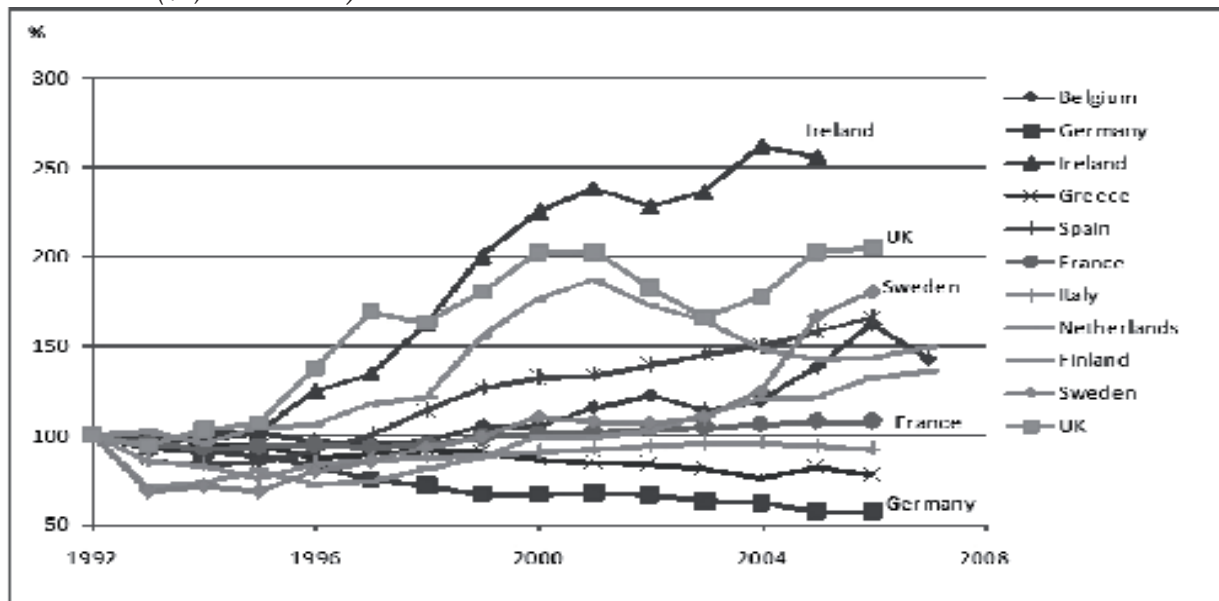
Figure 4. Evolution of real sales prices for agricultural land in the EUSCs, 1992–2007 (€/ha)



Notes: For 1992–96, GDP deflator for Germany, OECD; for 1997–2007, harmonised indices of consumer prices, euro area, Eurostat.

Source: Own calculations based on Eurostat (2008).

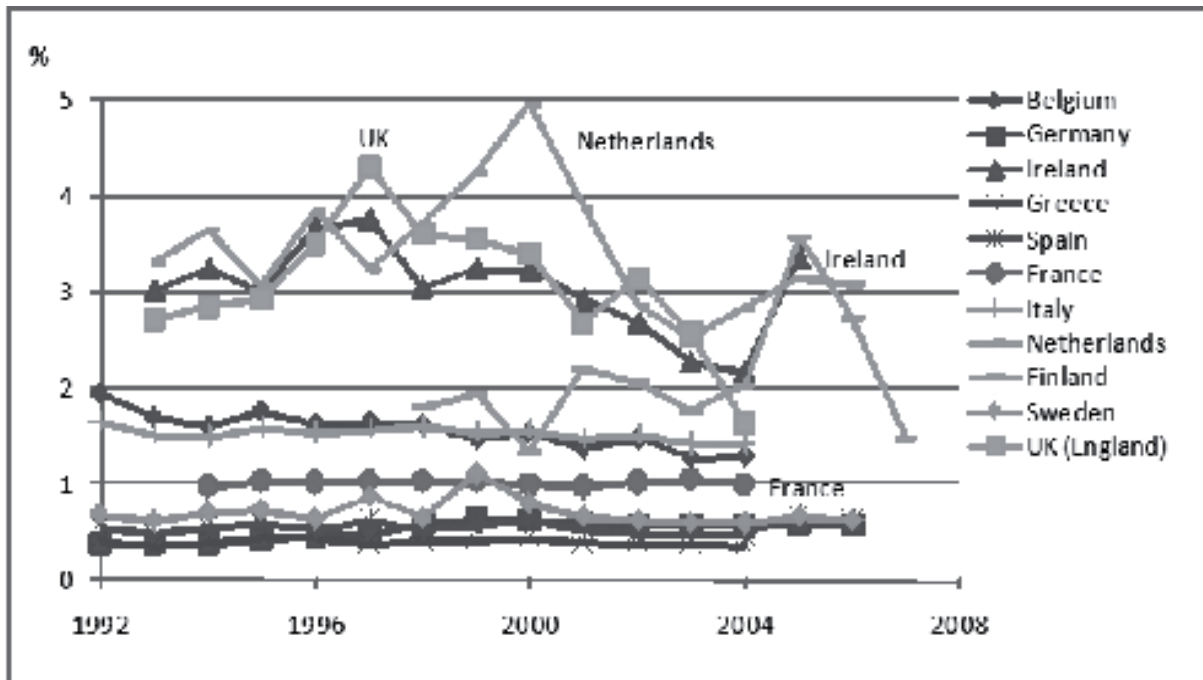
Figure 5. Evolution of sales price indices for agricultural land in the EUSCs, 1992–2007 (% , 1992=100)



Notes: For 1992–96, GDP deflator for Germany, OECD; for 1997–2007, harmonised indices of consumer prices, euro area, Eurostat.

Source: Own calculations based on Eurostat (2008).

Figure 6. Evolution of agricultural land sales as a percentage of total UAA in the EUSCs, 1992–2007



Source: Swinnen, Ciaian and Kancs (2008).