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# Impact of decoupling and modulation in the European Union - a sectoral and farm level assessment

AgriFood economics centre

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## Summary

Introduction of the Single Payment Scheme (SPS) in 2005 constitutes perhaps the most radical reform of the Common Agricultural Policy ever. This payment has replaced almost all previous forms of subsidies to farmers and is *decoupled*, i.e., paid regardless of whether the farmer produces or not, as long as land is kept in good agricultural and environmental condition (GAEC). Such a radical reform was expected to have a profound impact on European agriculture. This paper presents a synthesis of the findings of a large EU project, IDEMA. The aim was to assess the potential impacts of decoupling on production, prices, trade flows, farm income, structural change and the environment at the EU and regional levels. Due to the complexity of the issues at hand and the lack of historical data, three complementary evaluation approaches were used: surveys of farmers' intentions, sector modelling and agent-based models of regional structural change.

Surveys and modelling results provide no strong evidence that farmers intend to change their strategic decision to exit agriculture. Instead structural change is shown to slow down when payments are decoupled because minimal land management becomes an additional source of income. Decoupling as a result is also shown to reduce farmers' off-farm labour supply. In the New Member States the impact of the *accession* is the dominating effect: the introduction of CAP payments results in larger numbers of farmers remaining in the sector and increased competition for land.

Other aims of the reform included boosting farm incomes and improving competitiveness. The reform has also, undoubtedly, increased market orientation of EU farmers and reduced trade distortions. The SPS is shown to increase farm incomes but also land rental prices in most regions. Capitalization of payments in land values over time will, however, erode the ability of the reform to support incomes in the long run as incumbent farmers retire or otherwise leave the sector.

The impacts of the reform would have been very different if there was *no* link between the decoupled payment and land. Without the GAEC obligation model results indicate a strong increase in average farm size as greater numbers of farmers would leave the sector and make their land available to remaining farms (significant areas of land are though shown to be abandoned in the most marginal regions). Due to the significantly lower land (rental) prices and size economies that emerge from this policy, profits per hectare are generally higher. Thus it can be argued that the objective of improving competitiveness has not been achieved due to slower structural change and the higher land prices that follow from the 2003 reform.

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# 1 Introduction

Since the early 1990s, the Common Agricultural Policy (CAP) has been gradually reformed towards increasing market orientation. Price-related support dominated agricultural policies in the EU other OECD countries in the 1970s and 80s. Two reform packages in the 1990s replaced a large share of the price support in the EU by direct payments per hectare of land and per head of livestock. These direct payments were only paid to certain crops and certain types of livestock. The latest substantial reform of the CAP, the 2003 reform, constitutes a further radical change of European policies for supporting farmers. The central element of the reform is decoupling of direct payments from production via a Single Payment Scheme (SPS). The SPS is paid per hectare of agricultural land, but is independent of the individual farmer's output. It is paid regardless of whether the farmer produces or not, as long as the land is kept in Good *Agricultural and Environmental Condition* (GAEC). However, there are exceptions from the general principle of decoupling, since individual Member States (MS) are currently allowed to keep limited coupled payments for some products (partial decoupling).

The reform intended to make European agriculture more competitive and market-oriented, and at the same time provide support to farmers with less distortion of production and trade. However, in the public debate preceding the 2003 CAP reform it was argued that a decoupled SPS would lead to substantial abandonment of production in various regions and sectors, and an exodus from the most disadvantaged rural areas. Some farmers' organisations argued that production would shrink and considerable job losses would ensue. It was also claimed that farmers in less favoured regions may risk being squeezed out as economic land rents were often below the arable area payment. In this case landowners might reclaim their land from leaseholders and cash the decoupled payment themselves. Another concern voiced, was that decoupling would distort the market for previously unsupported products.

Assessing the potential impacts of decoupling was not a simple task because there are several potential links between support to agriculture and farm output. The impacts of support schemes that affect output prices are well known. These impacts can be removed by decoupling support from production, as is the case with the SPS. However, *indirect effects* may remain after decoupling, as agricultural support can induce production effects by its mere existence. These include the *income effect*, where the support potentially affects farmers' choice of on-farm labour supply. A *risk related effect* arises as risk-averse producers may increase output as a consequence of the support providing greater income security. Finally, *dynamic effects* may affect output through farmers' investment decisions and their expectations about future policy. Studies of indirect effects of agricultural support were up to this date few and with little consensus (Andersson 2004).

## *1.1 The IDEMA[4] project*

Uncertainty regarding the impacts of the 2003 reform due its radical nature—as well as the concerns voiced in the public debate—highlighted the need to provide comprehensive assessment of the impacts of decoupling on the EU farm sector. Accordingly, the European Community's Sixth Framework Programme included, under the heading of CAP reform, a call entitled: 'Decoupling—Development of various tools and methods for the impact assessment of decoupling'. The assignment was to assess the impact of combining existing direct payments into a decoupled income support scheme and in particular quantify the impact on:

- supply, demand, trade and prices for major commodities;

[4] This paper represents a synthesis of the research performed within the IDEMA project which was supported by the European Community's Sixth Framework Programme (SSPE-CT-2003-502171). www.agrifood.se\IDEMA

- localisation of production;
- land market and prices;
- farm income and structural adjustment of holdings;
- entries and exists from the agricultural sector; and
- land use and environmental impacts.

The IDEMA project was organised to respond to the above objectives. The research was performed by 9 partners in 8 countries with the AgriFood Economics Centre in Sweden (formerly SLI) as coordinator. The choice of approach for IDEMA was influenced by two main factors: the radical nature of the reform and the complexity and immensity of the issues to be addressed. The radical nature of the reform implies limited possibilities to generalize from past experiences. Further the reform was implemented after the project started; hence there was no historical data that could be used in econometric analyses. As the implications of decoupling are multifaceted, no single methodological approach was considered sufficient rather a multiplicity of complementary approaches were applied. Accordingly, the project was organised around the following three approaches:

a) survey-based analysis of farmers' strategic decisions,
b) dynamic agent-based regional modelling with AgriPoliS, and
c) sector level and general equilibrium modelling with ESIM.

The different approaches complement each other as they can answer different questions on the possible impacts of decoupling agricultural support. The need to analyse the expected reaction of agriculture at different scales (EU, national and regional) made the use of different models necessary. Agent-based regional modelling is appropriate to analyse impacts on for example structural change (the development towards fewer and larger farms), while sector level modelling is suited for analysing impacts on, e.g. product markets. These modelling approaches can be contrasted with results from surveys that investigate how farmers intended to react to decoupling. The methodological approaches are also complements with respect to their weaknesses. Surveys of farmers' intentions are biased by farmers' expectations about policy evolution. Models are, on the other hand, limited by the behavioural assumptions they are based on. By combining and extending the three main approaches and applying them simultaneously to a sample of Member States (MS), the project was able to cover the most important potential impacts of decoupling CAP support from production. In this paper we focus on the results of the survey and agent-based regional modelling. Aggregate effects of decoupling are covered by a range of other studies (see Balkhausen et al. 2008 for an overview). Environmental impacts are presented in the paper by Brady (2010) in the proceedings from this workshop.

# 2 Survey based analysis of farmers' intentions

Predicting the impacts of radical policy change when no historical data are available is naturally a challenging task. One solution is to ask those who will be affected by the reform, the farmers, how they intend to respond. Accordingly, a survey instrument was considered a valuable tool to study the reform. Detailed results from this study are presented in Douarin *et al.* (2007). The objectives of the survey were not only to establish what farmers intended to do but also to understand their reaction patterns and underlying motives. Do farms react differently depending on farm structure, region, farm financial performance, human capital, age, etc.?

Surveys have both advantages and disadvantages. They provide information without *a priori* assumptions and provide insights into farmers' business confidence (Thomson & Tansey, 1982). Opinions about whether surveys are good predictors of actual farmer behaviour are

though mixed. Some authors provide evidence that in the short-run farmers actually implement their intentions (Harvey, 2000; Tranter *et al.*, 2004); whereas others show that a survey response constitutes a weak predictor of actual behaviour (Vare *et al.*, 2005). Furthermore, answers are biased by respondent's expectations about policy evolution and respondent's attempts to influence the outcome of the analysis (Thomson & Tansey, 1982).

A unique dataset was collected regarding farmers' planned activities in the post-2003 era in five MS (France, Lithuania, Slovakia, Sweden and the UK). The choice of countries incorporates a mix of Old (EU-15) and *New Member States* (NMS). To understand the specific effects of the switch in policy, farmers were asked to state their intentions under two main policy frameworks. This would in particular allow comparing farmers' intentions holding everything else but the policy framework constant. The two policy frameworks considered were:

a) Continuation of policies under **Agenda 2000** in EU-15 and continuation of **pre-accession** policies in NMS, which provided a benchmark as to what farmers would have done if the previous policy framework with coupled support was continued.
b) Intentions under the 2003 CAP **reform** as it was to be implemented in each MS.

Data was collected through face to face interviews, except in Sweden where a postal survey was conducted. To avoid collecting large amounts of data on economic performance and structural characteristics of farms, IDEMA survey data was matched to Farm Accountancy Data Network[5] (FADN) records. The rationale was to use the wealth of information included in the FADN system to be able to analyse farmers' responses in conjunction with historic records of farm performance and structure. It was however necessary to collect additional information, particularly demographic, which is usually missing in FADN databases. Primary data were collected on intentions to exit from or stay in agriculture, as well as intentions to change the area of land farmed or the production mix. Data were also collected in relation to farmers' objectives, values and attitudes concerning policy support.

The questionnaire was pre-tested and discussed with focus groups. Data collection took place February to November 2005 in all five countries. Table 1 provides general information about the survey and the matching FADN.

**Table 1. Data available from the survey and from FADN**

| Country | Type of survey | Sample size | Matching FADN |
|---|---|---|---|
| | | | |
| England | Face to face | 153 | 1998-2002 |
| France | Face to face | 281 | 2002, 2003 or 2004 (one year only) |
| Sweden | Postal | 344 | 1999-2002 |
| Lithuania | Face to face | 220 | 2000-2002 |
| Slovakia | Face to face | 154 | 2001-2002 |

*Source: Douarin et al. (2007).*

## *2.1 Farm survival and growth*

Understanding the determinants of farm survival or exit/closure is critical for capturing the forces of structural change in agriculture. The determinants of strategic decisions under the different policy scenarios were investigated to assess what the main factors behind an

[5] FADN is the European Commission's system to collect accountancy and production data for a sample of farms in each of the MSs.

intention to exit from farming were, and to understand which factors were recurrent and which varied with the policy framework. This was done using a Probit model (i.e. 0 or 1 response variable) with the dependent variable being the decision to stay in or exit from the farming sector within the coming 5 years. Farmers operating larger farms were shown to be more likely to stay in farming in all scenarios.

Growth is another important component of structural change. In the case of our study, the distribution of farmers' plans to grow was strongly biased towards "no change" as many respondents stated they were not planning to alter the size of their farm in the coming 5 years and towards "no downscaling" as very few respondents reported a plan to reduce the size of their farm. Under these circumstances, econometric analyses are only possible using a discrete variable based on the farmer's plan to grow with two categories: intending to grow or not intending to grow. Therefore, the determinants of growth were also analysed using a Probit model that contrasted the farmers intending to grow with the rest of the respondents.

Results showed that younger farmers are more likely to grow, but farm size seems to have no impact on growth intensions. Better performing farms were also more likely to grow under the decoupled policy. Regarding the determinants for both exit and growth there is no clear difference between EU-15 and the NMS.

### 2.1.1 Farmers' adjustment to decoupling in EU-15

According to farmers' intentions, the introduction of decoupled payments will have little direct effect on structural change in England. Few farmers plan to modify their exit or growth decisions under SPS arrangements compared to what they would have done if they faced a continuation of Agenda 2000. Under both scenarios the key characteristics of farmers intending to exit in the short-term (defined as the next five years) were the same: elderly farmers specialised in COP production (cereals, oilseeds and protein crops) and with high value added without net current subsidies per hectare.

The more pronounced adjustment concerns production choices (even though the majority of the respondents were not planning to change their output mix, some intended to reduce their cattle herds) and to a certain extent diversify to off-farm activities. Therefore, this early empirical research suggests that in England the adjustments to the 2003 reform are likely to be subtle and to affect mainly production choices and diversification.

The French sample is limited in coverage. Nevertheless, the French results are similar to the findings from England in that few farmers intended to alter their plans to exit or grow as a result of the introduction of the SPS. Intentions are hardly affected by the switch to the SPS in France, which may be expected given the conservative manner in which France has chosen to implement the SPS. Relatively greater adjustment is likely to be witnessed, however, in the output mix of farms and the allocation of time devoted to off-farm work.

In Sweden, in contrast to England and France, the implementation of SPS is more likely to stimulate structural change as some farmers are planning to exit earlier than they would have done under Agenda 2000. Very little land is however likely to be abandoned as the demand for land for farm growth persists after the change in policy. The predicted changes in production mix are also relatively stronger in the Swedish case and likely to be characterised by (a) a movement away from COP and (b) the extensification of livestock production. The Swedish farmers also intended to keep some land in GAEC without producing on it. These plans are consistent with prior expectations concerning the impact of decoupling, i.e. to use less intensive farming practices and reduced incentives to produce.

It became evident that farmers intended to apply a minimal adjustment strategy in response to changes in agricultural policy, at least in France and England. There is no strong evidence that farmers intended to drastically change their strategic decisions to exit agriculture. Few farmers were interested in merely keeping land in good agricultural and environmental condition (GAEC) and not producing. From this point of view, the results of our

study are in line with previous studies which investigate farmers intentions in response to policy change (Harvey, 2000; Tranter et al., 2004; Chatellier and Delattre, 2005; Breen et al, 2005). However, results for Sweden are in contrast with this, as farmers are intending to change their exit and growth plans, but depending on the details of the policy implementation.

### 2.1.2 Impacts in EU-10

In the NMS (Lithuania and Slovakia), the implementation of the 2003 CAP reform has a different meaning. The implementation of SAPS (a somewhat simplified version of the SPS) in the NMS provides a significant increase in the degree of support offered to farmers, with both higher and more predictable payments. Therefore, it is not surprising that in Lithuania the main impact of the payments is evidenced in a greater willingness to operate larger farms. Seeing that the returns to agricultural activities are likely to rise, farmers are less interested in diversification and have no desire to leave land uncultivated under GAEC. This comparable pattern is repeated in Slovakia: the switch from the pre-accession policy to the SAPS induces a significant rise in the numbers who wish to stay in agriculture. However, in Lithuania and Slovakia, the characteristics of those seeking to stay or expand vary. The decisions to stay or grow were poorly explained by the set of variables available for the analysis in Slovakia, whilst in Lithuania, farmers' characteristics were shown to be dependent on age, succession status and off-farm work experience. In Slovakia, the likelihood of expansion was related to managerial experience and farm location (LFA regions). In Lithuania, expansion plans were linked to lifecycle variables (age and succession status).

In analysing the differences between the EU-15 countries and NMS, it should be noted that what has been studied in the NMS is not so much the effect of a switch from coupled to decoupled payments but the effect of the introduction of CAP payments as a result of EU accession. From this point of view, the differences in responses between the EU-15 and NMS are understandable as farmers respond to contrasting policy changes. The main conclusions regarding the NMS are that introduction of CAP payments gives incentives for farmers to stay longer in farming and to grow, and that CAP payments also make farmers in the NMS less interested in diversification.

## *2.2 Farmers' attitudes and expectations*

Can differences in farmers' attitudes and expectations be linked to diverging behavioural intentions to adjust to the 2003 CAP reform? To analyse this question, the pooled sample of farmers interviewed in the five countries studied was utilised, and it was investigated whether there are significant differences in farmers' attitudes to agriculture and policy support amongst the MS. An ANOVA based analysis was developed regarding farmers' attitudes towards support and off-farm work, and the relationship with intentions to exit and grow.

The comparative cross-country analysis generates several important insights for policy, stemming from the analysis of farmers' attitudes across the pooled sample of five states. First, most farmers still possess a protectionist mindset and do not accept the idea that they could survive or be competitive without policy support. The sampled farmers strongly disagree with statements advocating the removal of policy support and, at the same time, express preferences for the full utilisation of agricultural land for production and concentrating on farming. More than one-third of the respondents strongly disagreed with the notion that good farming skills are sufficient to run a profitable business whatever the design of European policies. At the same time, half of the respondents think that the CAP system of support imposes restrictions on their future farming plans. So, it appears that farmers rely on policy support although a large proportion of them realise that this support might be conditional on some restrictions on their farming activities. The only farmers who endorse policy liberalisation are those who are largely based in sectors that traditionally receive little CAP support (pigs and poultry).

Secondly, the often advocated strategy of diversification and development of multiple income sources still creates difficulties for a substantial proportion of European farmers. This is due to a mixture of beliefs that farmers should focus on the production of food and fibre, and a lack of appropriate skills and off-farm opportunities. More than 40 percent of the respondents do not think they can easily find a job off-farm or increase the number of hours devoted to off-farm work. This emphasises once again the limitations of rural development policies that are focused solely on the farming community. Farmers are unlikely to create a significant number of new jobs through the pursuit of enterprise diversification, which is an infeasible option for many, and their own future prosperity depends on the availability of work in the non-farm rural economy. Pessimism surrounding the opportunities for diversification is not confined to the relatively poorer NMS. In fact, upland grassland farmers in England are the most pessimistic about their ability to adapt.

Third, although the overwhelming majority advocate protection, farmers are more flexible in terms of the instruments through which policy support might be delivered. One of the positive messages emerging from this research is that the majority of respondents agree with the need for farmers to produce attractive landscapes and positive environmental externalities, and be paid for this. The non-pecuniary benefits of farming also feature prominently. The latter are crucial for understanding why farmers' responses to policy reforms have been rather modest or at least more modest than expected.

Finally, the strongest opposition to policy liberalisation comes from farmers in the NMS. Newcomers to farming in the NMS strongly reject policy liberalisation and endorse notions that farmers should concentrate on agriculture which corroborates with the previously mentioned intentions to stay longer in agriculture or grow. For them diversification seems to be associated with liberalisation tendencies. These views are likely to have important implications for the decision-making processes surrounding agricultural policy reform in the EU. The new entrants to the Union are expected to strengthen the political opposition to agricultural policy reform and undermine attempts to extend the reform measures, including capping and further modulation of the Single Payment Scheme.

# 3 Agent-based regional modeling

The impact of decoupling on structural change is one of the key issues related to the 2003 reform. Will structural change speed up after the introduction of decoupled payments or will it slow down? An important part of the IDEMA project has been the use of modelling to study the impact of decoupling on agricultural structural change. This was done for selected regions of the enlarged EU. The model used for this investigation is AgriPoliS (Kellerman *et al.* 2008), an agent-based spatial and dynamic simulation model of agricultural structural change (cf. Happe 2004, Happe et al. 2006). The origin of the model dates back to work by Balmann (1997), who studied path-dependencies in agricultural structural change with an agent-based approach. Whereas Balmann's model was based on a hypothetical farm structure, AgriPoliS can be calibrated to empirical farm data and regional statistics (Sahrbacher & Happe 2008). Accordingly, this makes the model applicable for policy analysis and empirically-based analysis of regional structural change.

In IDEMA we adapted AgriPoliS to 11 case study regions in the EU-25 (Sahrbacher *et al.* 2005). These case study regions were chosen to cover a diversity of farming in Europe. The case-study regions, Figure 1, are characterized by the following criteria: agronomic (North/South), socio-economic (high income/low income regions), mode of operation (intensive/extensive agriculture), scale of farm operation (small/large farm) and legal form (private/corporate).

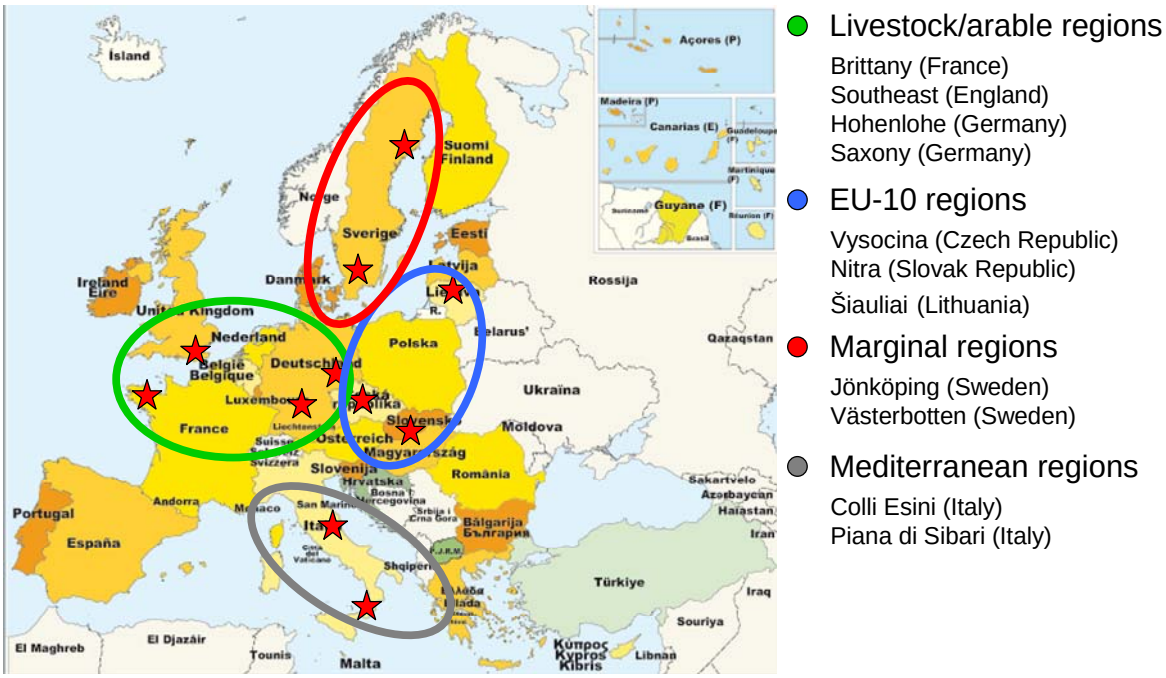



**Figure 1.** Location of the case study regions.
*Source: Sahrbacher et al. (2005).*

## *3.1 The AgriPoliS model*

The core of AgriPoliS is the understanding of a regional agricultural structure as a complex, evolving system (Happe 2004). The key entities in the model are a population of individual farms which evolve subject to their current state and to changes in their environment (e.g. CAP reform). This environment consists of other farms, factor and product markets, and land/space, which are all embedded within the existing technological and political environment. Space is represented by a 2-dimensional grid of equally sized cells or plots. Five different landscape layers are used to represent the structure of agriculture and the landscape in each region, for details see Kellermann et al. (2008). As a result the model can simulate from policy to individual farms and changes in cropping patterns at the plot level based on farm-agent behaviour. This regional agricultural system is shown schematically in Figure 2 which shows the interactions between the three central components of agricultural structures: farms, markets and land.

Farm agents are assumed to act autonomously and to maximise family income (or profit for corporate farms) from their economic activities. For this, production and investment decisions are made simultaneously based on a recursive mixed-integer linear programme. However, decision-making of a farm is bounded rational since decision-making is myopic and strategic aspects are only included in a rudimentary manner. Except for price information on land rents and product and input prices, individual farms in AgriPoliS do not consider other farms' production decisions, factor endowments, size, etc. Farm agents are also bounded rational with respect to expectations; in the majority of cases, farm agents follow adaptive expectations. In the model, policy changes are anticipated by farmers one period in advance and included into the decision-making process.

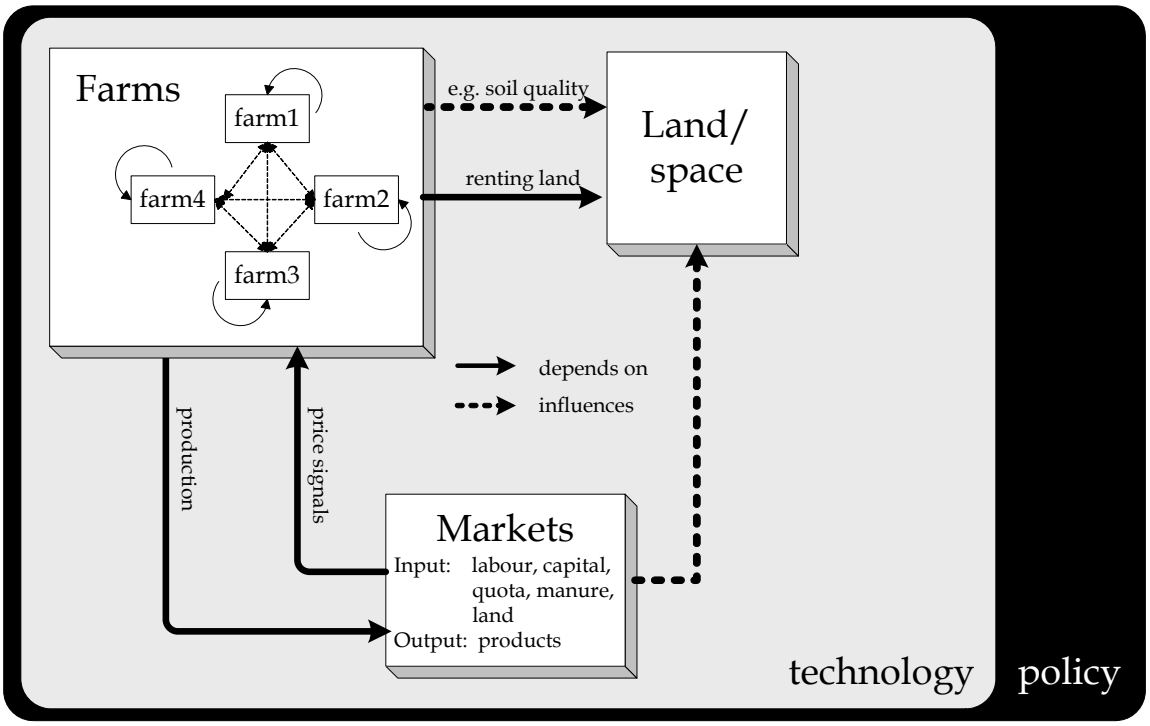



**Figure 2.** A conceptual model of a regional agricultural system.
*Source: Kellermann et al. (2008)*

Figure 3 displays the decision hierarchy for an individual farm agent during one period of simulation. Based on this figure, the most important actions undertaken by a farm agent are renting land (renting additional land and disposing of unprofitable land), investment, production, farm accounting and the decision whether to quit farming or stay in the sector.

Farm agents can produce goods normal to the region or might be expected to be produced as a result of policy reform. In order to produce, farm agents utilise buildings, machinery, and facilities of varying type and capacity. With respect to this, AgriPoliS implements economies of size; with increasing investments in capacity, unit investments costs decrease. Moreover, labour is assumed to be more effectively used with increasing size. AgriPoliS also aims to mimic the effect of technological progress; it is assumed that with every new investment, unit costs of production decrease by a certain proportion.

Farms can engage in rental activities for land, production quotas and manure disposal rights. Labour can be hired on a fixed or hourly basis and farm family labour can be offered for off-farm employment. To finance farm activities and to balance short-term liquidity requirements, farm agents can take up long-term and/or short-term borrowings. Liquid assets not used within the farm can similarly be invested with a bank at market rates of interest for government bonds. Farm agents quit production and withdraw from the sector if equity capital is zero, the farm becomes illiquid or if opportunity costs of farm-owned production factors are not covered. Finally, farm agents are differentiated not only with respect to their specialisation, farm size, factor endowments and production technology, but also with respect to managerial ability.

At this development stage, agents in AgriPoliS interact indirectly by competing on factor and product markets. Interaction is organised by markets that explicitly coordinate the allocation of scarce resources such as land or the transaction of products. In this respect, the *land market* is the central mode of interaction between farm-agents.

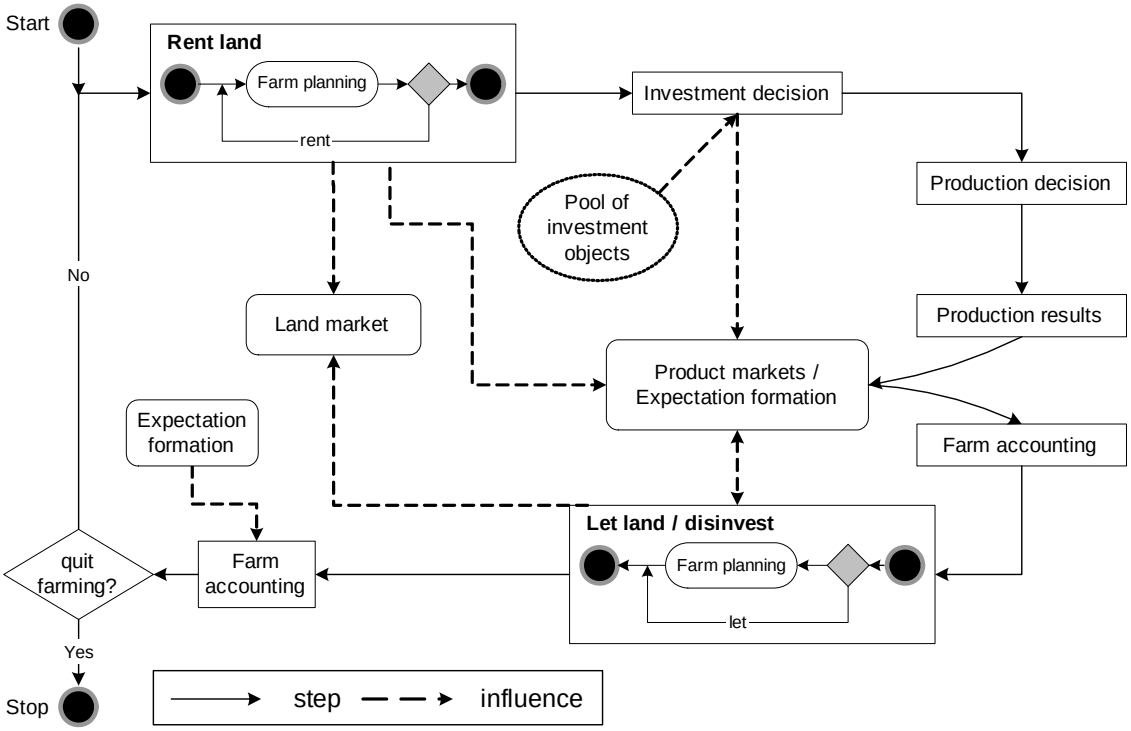



**Figure 3.** Course of events in one planning period for one farm agent.
*Source: Kellermann et al. (2008)*

## *3.2 Evaluated policy scenarios*

The AgriPoliS simulations were run over a 13 year period from 2001 to 2013 (the end of the current programme period). We considered four policy scenarios in EU-15 these being:

- A benchmark scenario which represents continuation of the Agenda 2000 framework with coupled payments beyond 2004 (referred to as **AGENDA)**.
- The actual 2003 CAP reform, including partially decoupled payments as it was implemented in each MS in 2005 (**REFORM**).
- A Bond scheme where the obligation to keep land in good agricultural and environmental condition (GAEC) in the REFORM scenario is removed (**BOND**). In this scenario the SPS for each farm is not distributed as a payment per hectare of managed land, but goes directly to the farmer. In other words the farmer can produce or choose to leave the sector and still receive support.

## *3.3 New Member States (EU-10)*

Due to space restrictions we have chosen not to present detailed results for the NMS in this paper. Since these countries went from pre-accession policies directly into decoupled CAP payments they require additional clarification. Briefly, from AgriPoliS results it was evident that the impact of accession dominates the effect of decoupling. However, results vary between the three countries analysed. In Czech Republic and Slovakia, EU accession meant significantly higher payments to agriculture, while in Lithuania payments were comparably high before accession. Consequently, the introduction of CAP payments has a negligible impact on structural change in Lithuania, while structural change slows down considerably in Czech Republic and Slovakia. For analysis and results for the NMS we refer the reader to the following IDEMA Deliverables: Czech Republic (Jelinek et al. 2007), Lithuania (Stonkute et al. 2007) and Slovakia (Blaas et al. 2007).

## *3.4 Impacts of decoupling on farming in EU-15*

As previously stated, a key advantage of AgriPoliS is that it models structural change in space and time. In this section we present results regarding the impact of the 2003 reform on farm structure, income, land rental prices and land use for six regions in the EU-15.

### 3.4.1 Farm structure

AgriPoliS results presented in Figure 4 show that structural change slows down due to the REFORM compared with a continuation of Agenda 2000 (Sahrbacher et al. 2007). As a consequence average farm size shown in Figure 5 is also smaller in the REFORM scenario (i.e. farms grow more slowly) than compared to AGENDA in 2013. The rationale behind this result is that particularly farmers with grassland remain in the sector, because decoupled payments provide additional income opportunities. For these farms, simply maintaining some or all grassland in good agricultural and environmental condition is more profitable than off-farm work.

The hypothetical BOND scheme scenario implies that the linkage between the SPS and land is broken such that the payment is granted to the farmer independent of any farming activity. This scenario represents to some extent a gradual phasing-out of direct payments to agriculture since, over time, more and more payment entitlements will belong to farmers who have left the sector (e.g. retired). AgriPoliS results for the BOND demonstrate that the Bond speeds up structural change considerably in all regions compared to both AGENDA and REFORM, Figure 4, which also results in significantly larger average farm size in all regions, Figure 5.

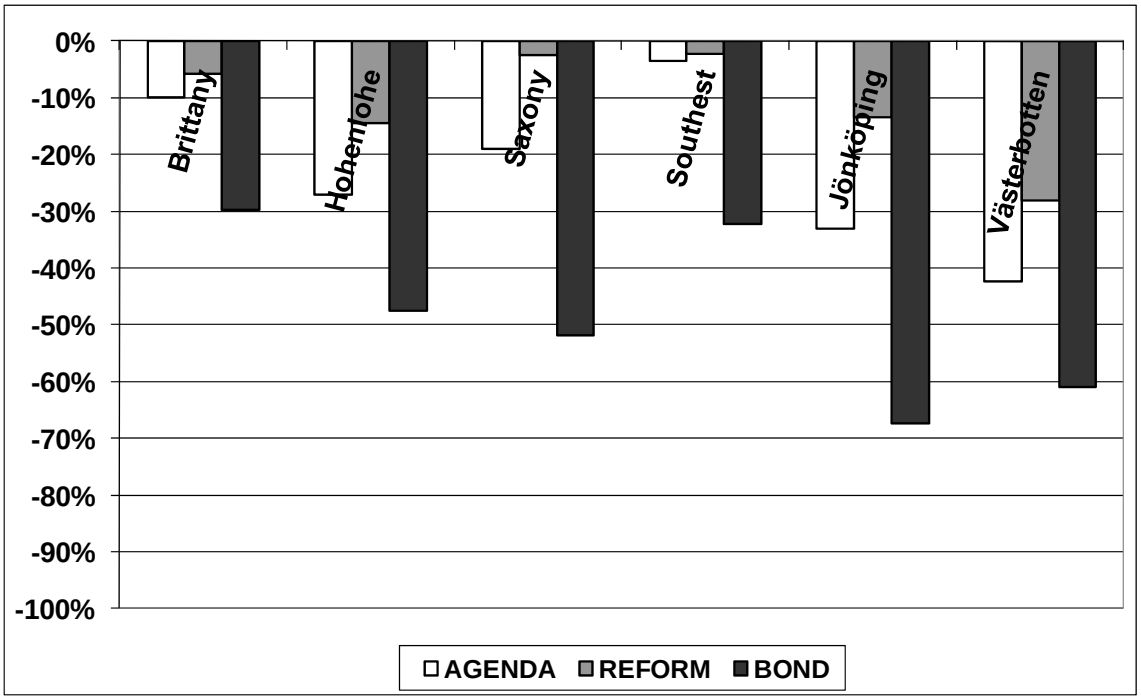



**Figure 4.** Change in number of farms from 2004 to 2013 with the Agenda 2000 scenario, actual implementation of the 2003 reform and Bond scenario.
*Source: Sahrbacher et al. (2007)*

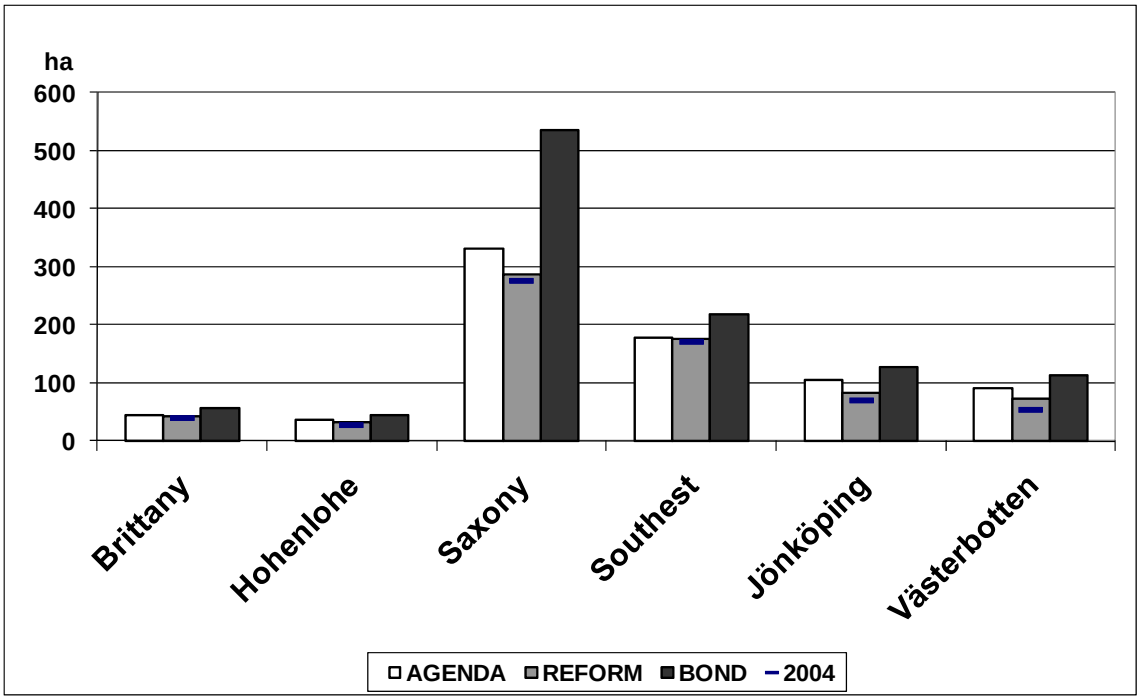



**Figure 5.** Average farm size in 2013 with the Agenda 2000 scenario, actual implementation of the 2003 reform and Bond scenario.
*Source: Sahrbacher et al. (2007).*

### 3.4.2 Farm income and land rental prices

The impact of decoupling on farm income is particularly relevant, because both the former direct payments and the decoupled SPS have the purpose of providing farmers with a stable income. AgriPoliS results show that average farm income increases due to decoupling in the REFORM scenario compared to AGENDA. This is shown in Figure 6 using average profit per hectare as an indicator of farm income: average profit per hectare is higher in all regions in 2013 when direct payments are decoupled from production. Income increases because decoupling gives farmers more freedom to choose whether or what to produce, and because product prices increase as a result of lower total EU production volumes (these price changes were taken from ESIM and fed into AgriPoliS).

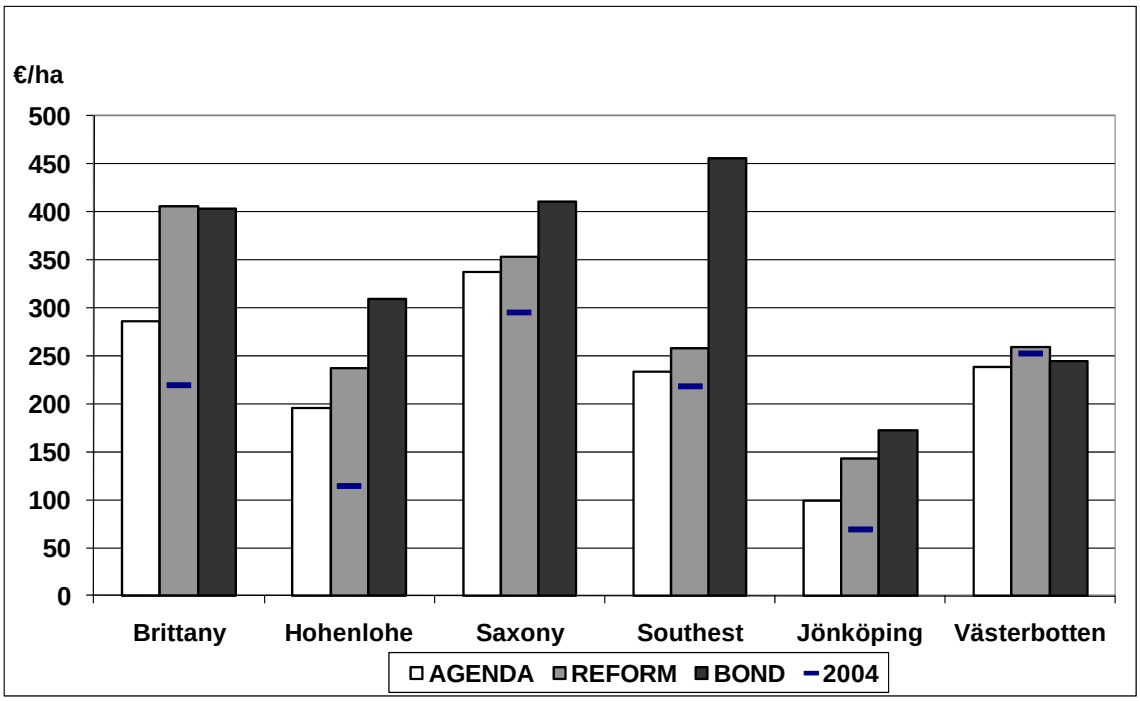
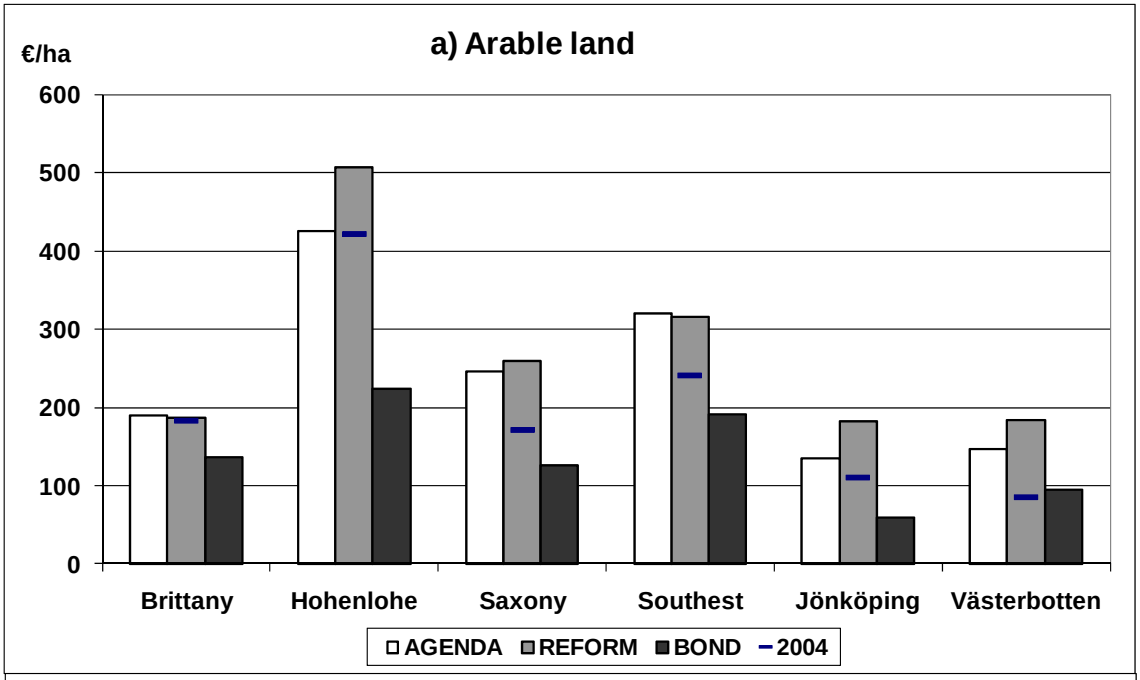



**Figure 6.** Average profit €/ha in 2013 with the Agenda 2000 scenario, actual implementation of the 2003 reform and Bond scenario.
*Source: Sahrbacher et al. (2007)*

As might be expected, decoupling does not overcome the problem of capitalisation of payments in land values. Figure 7 (a) shows that decoupling leads to increased arable land rental prices in Hohenlohe, Jönköping and Västerbotten. Grassland rental prices increase significantly in regions that had considerable cattle payments prior to decoupling, Figure 7 (b), since cattle payments were redistributed to agricultural land as part of the reform. Rental prices in Brittany do not increase due to a regulated land market (Latruffe & Le Mouel 2006).

Breaking the link between the SPS and land in the BOND scenario implies that the decoupled payment should no longer capitalise in land rental prices, as it is not necessary to have land to collect the payment. AgriPoliS results for the Bond scenario show that land rental prices fall significantly in all regions—except Brittany—compared to AGENDA, Figure 7. The lower land rental prices combined with increased efficiency due to structural change compensate for payments leaving the sector with exiting farmers. The resulting effect is higher average profit per hectare in all regions compared to AGENDA, which is illustrated in Figure 6. In several regions there is a significant increase in profits even compared to the REFORM, i.e. Hohenlohe, Saxony, Southeast and Jönköping which implies improved competitiveness.



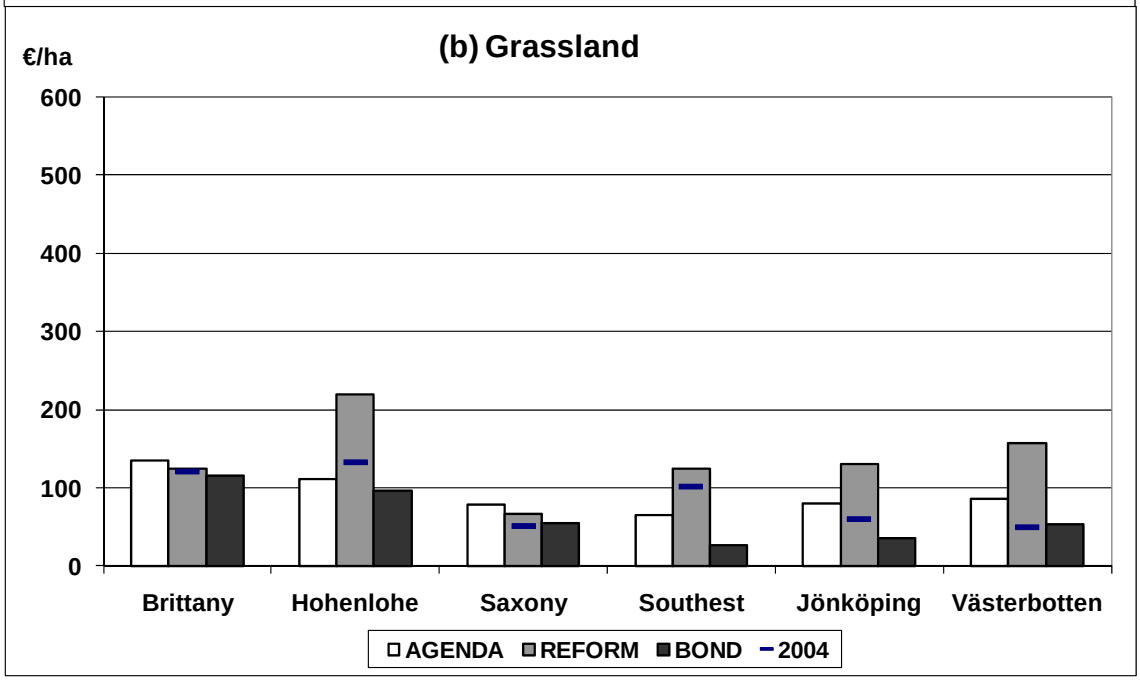




**Figure 7.** Average a) arable and b) grassland rental prices €/ha in 2013.
*Source: Sahrbacher et al. (2007)*

### 3.4.3 Land use

An interesting policy question in light of continued CAP reform is what implications a Bond type scheme would have for land use and in particular, the area of land not profitable for agricultural production which we assume becomes abandoned. Table 2 shows developments on the modelled land market as a result of introduction of the BOND scenario in 2005. It can be seen that the large numbers of farms that exit the sector in 2005 release significant areas of land (i.e. > 10 % of the agricultural area) to the land market in all regions except Brittany. Even farms remaining in the sector release land in this scenario, and mainly in the form of grassland due to a decline in beef and milk production. However this does not translate to equivalent areas of abandoned land. As shown in the row "*Land rented by other farms*" in Table 2,

remaining farms are able to take advantage of the greater volume of land released to the land market to increase farm size (as shown in Figure 5). Still the Bond scenario leads to land abandonment, principally grassland, and in particular in Hohenlohe and Jönköping. In the other regions remaining farms continue to manage 89–99 % of all land.

Note that even more land would have been abandoned in Jönköping if it were not for agri-environmental schemes which were sufficient to ensure that around 50 % of the area of semi-natural grassland was preserved. The existence of National support in Västerbotten—coupled primarily to milk production at 0.10 €/kg—was sufficient to buffer most effects of the Bond, which otherwise has similar production conditions to Jönköping. Hence in evaluation of the effects of CAP reform it is important to consider the implications of interacting Pilar II policy instruments. Obviously the wide-scale land abandonment in Hohenlohe and Jönköping is likely to be negative for landscape value and biodiversity (see Brady et al. 2009).

**Table 2.** Farms quitting, area released and area left idle due to introduction of a Bond scheme in 2005 compared to 2004.

| | **Brittany** | **Hohen-lohe** | **Saxony** | **South-east** | **Jönköping** | **Väster-botten** |
|---|---|---|---|---|---|---|
| *Number of farms* | -18 % | -28 % | -47 % | -23 % | -44 % | -34 % |
| *Land released by quitting farms* | 5 % | 21 % | 15 % | 16 % | 51 % | 25 % |
| *Total area released* | 16 % | 32 % | 30 % | 19 % | 53 % | 32 % |
| *Land rented by other farms* | 15 % | 13 % | 19 % | 9 % | 22 % | 12 % |
| *Abandoned land* | 1 % | 19 % | 11 % | 10 % | 31 % | 11 % |

*Source: Sahrbacher et al. (2007).*

# 4 Conclusions

The IDEMA project analysed impacts of decoupling EU agricultural support from production. The central element of the 2003 CAP reform is the introduction of the Single Payment Scheme (SPS) which is linked to land but *decoupled* from production. Both the 2003 reform and a hypothetical Bond scheme were analysed compared to continuation of the previous Agenda 2000 framework to the end of the current programme period, 2013. The more radical Bond scheme was designed to test the implication of the link to land, i.e., the obligation to keep land in "Good Agricultural and Environmental Condition" (GAEC). The Bond effectively breaks this link, as farmers still receive the decoupled payment even if they leave the sector.

## *4.1 Farmers' attitudes*

Survey results revealed that most farmers do not accept the idea that they could survive or be competitive without policy support. There is however no strong evidence that farmers would drastically change their strategic decisions to exit agriculture in response to the reform (with some exception in Sweden depending on the policy in place). The strongest opposition to policy liberalisation comes from farmers in the NMS. There is also pessimism surrounding the opportunities for diversification. More than 40 % of respondents do not think that they can 'easily' find a job off-farm or increase the number of hours devoted to off-farm work. The majority of respondents agree with the need for farmers to produce attractive landscapes and positive environmental externalities—and be paid for it.

The main conclusions regarding the NMS are that introduction of CAP payments provides greater incentive for farmers to remain in agriculture and to grow, but makes them less interested in diversification.

## *4.2 Impacts of the 2003 CAP reform*

Survey and regional modelling results indicated that the impacts of the 2003 CAP reform are moderate compared to continuation of the previous Agenda 2000 framework of coupled direct payments. The greatest impacts occur in the beef and sheep sectors, particularly in regions with high production costs. Individual MS decisions to partially couple payments to production help to maintain beef and lamb supply that otherwise would have declined. Decoupling leads to a small shift towards crops which were not eligible for direct payments under Agenda 2000 or pre-accession. Some land is also taken out of commodity production and managed according to the minimum GAEC obligation, primarily in high cost regions. Lower aggregate supply of agricultural products due to decoupling changes the net trade position of the EU from a clear net export position to a more neutral situation or even a net import situation (Balkhausen & Banse 2006).

There is no strong evidence that farmers intend to drastically change their strategic decision to exit agriculture. In fact, AgriPoliS results indicate that structural change slows down when direct payments are decoupled according to the 2003 reform. In turn the 2003 reform may reduce farmers' off-farm labour supply as farmers take advantage of the new income opportunities that arise as a result of the reform (i.e., the option of minimal land management without having to produce).

It is clear that the existence of a link between payment entitlements and land is crucial for the impacts of the 2003 reform. Model results show that a Bond type of decoupled payment leads to a faster rate of farm exits and a strong increase in average farm size, compared with the 2003 CAP reform. Many farmers leave the sector if off-farm jobs are available, as the decoupled payment is granted to a farmer independent of land or any farming activity (it is only based on historical production). However, in most cases average profits per hectare would be higher under the Bond scheme, due to significantly lower land (rental) prices and size economies due to farm growth in this scenario. The Bond scheme is shown however to result in abandonment of agricultural land (varying between 1–31 % of total agricultural area depending on the region). Hence, it might be motivated to strengthen agri-environmental schemes under a Bond alternative in affected regions to preserve landscape values (depending of course on public willingness to pay for landscape preservation).

## *4.3 Continued reform?*

The 2003 CAP reform intended to make European agriculture more competitive and market-oriented with less distortion on production and trade, and at the same time provide income support to farmers and prevent abandonment of land. As we approach the end of the current programme period in 2013 and the arguments for continued CAP reform are debated, it is important to ask whether the 2003 CAP reform has achieved its objectives. The reform has undoubtedly increased market orientation and improved farm incomes. A move to a full and uniform decoupling in all regions would improve the situation even further but not in a dramatic way. At the same time it can be argued that the objective of improving competitiveness has not been achieved due to slower structural change and higher land rental prices that followed from the reform. Implementation of a Bond-type scheme would constitute a better option from a competitiveness perspective, but this solution gives little value for money and may be difficult to achieve for political reasons. A more realistic and efficient solution for society is to gradually phase out the Single Payment Scheme and instead use targeted support (under Pillar II) to preserve landscape and environmental values in the particular regions that would be adversely affected by such a reform (e.g. increasing agri-

environmental payments for preserving extensive grasslands). Nevertheless it is likely that emotional arguments for continuing some type of general support payments will be made (e.g. for the provision of unspecified public goods). However, given the negative impact of such payments on competiveness, particularly in regions favourable to agriculture, the motivation and social opportunity costs for making these payments available to all of the EU's farmers should be carefully evaluated.

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