

Impact of decoupling and modulation in the European Union: A sectoral and farm level assessment¹

Mark Brady², Sone Ekman³ and Ewa Rabinowicz⁴

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Summary

Introduction of the Single Farm Payment (SFP) 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 the 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, financed by the Sixth Framework Programme. The aim was to assess the potential impacts of decoupling on production, prices, trade flows, farm income, structural change and the environment. This was to be done at the EU level and for selected regions representing the diversity of European agriculture. Due to the complexity of the issues at hand and the lack of historical data, the project relied on several complementary methodological approaches: surveys of intentions, partial and general equilibrium modelling and dynamic agent-based models.

Surveys and modelling results revealed that the impacts of the 2003 CAP reform are moderate compared with a continuation of the past policy. There is no strong evidence that farmers intend to drastically change their strategic decision to stay or exit agriculture. Model results indicate that structural change slows down when payments are decoupled because minimal land management becomes an additional source of income. Decoupling may also reduce farmers' off-farm labour supply. The SFP is also shown to have little impact on farm incomes in the long term, which is the primary aim of the SFP: to boost farm incomes. In the New Member States the impact of the *accession* is the dominating effect; the introduction of CAP payments results in a greater willingness to stay in farming and increased competition for land.

The environmental analysis indicated small impacts in relatively productive regions, since land use remains largely unchanged. In marginal regions, however, decoupling has a negative impact on biodiversity and landscape mosaic because of the homogenisation of land use that results from land being taken out of production. Existing agri-environmental schemes and national support acted however to buffer the full potential impacts of decoupling on landscape.

The results of the reform would have been very different if there was *no* link between the decoupled payment and land. In such a case the model results indicate a strong

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² Dr Mark Brady is based at the AgriFood Economics Centre, Dept. of Economics, Swedish University of Agricultural Sciences (SLU), Box 730, SE-220 07 Lund, SWEDEN. +46-46-2220784. E-mail: mark.brady@ekon.slu.se for correspondence.

³ Dr Sone Ekman is now based at the Swedish Board of Agriculture.

⁴ Prof. Ewa Rabinowicz is based at the AgriFood Economics Centre, Dept. of Economics, Swedish University of Agricultural Sciences (SLU).

increase in average farm size. Many farmers would leave the sector and significant areas of marginal land would be abandoned. However due to the subsequent lower land (rental) prices, profits per hectare would be higher or unchanged.

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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 in the 1970–80s, as in other OECD countries. 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 Farm Payment (SFP). The SFP is paid per hectare of agricultural land, but is independent of the individual farmer's production decisions. 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 direct 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 SFP would lead to substantial abandonment of production in several 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 such case landowners might reclaim their land from leaseholders and cash the decoupled payment themselves. Another concern, which was voiced, is that decoupling would distort the market for previously unsupported products.

Analysing the potential impacts of decoupling was not a straightforward task since there are several potential links between support to agriculture and farm output. The impacts of support schemes that affect incentive prices are well known. These impacts can be removed by decoupling support from production, as is the case with the SFP. 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 are up to this date few and with little consensus (Andersson 2004).

Uncertainty regarding the impacts of the 2003 CAP 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 integrating existing direct payments into a decoupled income support and in particular quantify the impact on:

- supply, demand, trade and prices for the main commodities;
- localisation of production;
- land market and prices;
- farm income and structural adjustment of holdings;
- entries and exits from the agricultural sector; and
- land use and environmental impacts.

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The IDEMA project

The IDEMA project was organised to respond to the above objectives. The research was performed by 9 partners in 8 countries with 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. Since the reform was implemented after the project started, there were no data available to assess its impacts. Econometric analyses based on historical data had therefore only limited scope for answering the posed questions. The project had to rely instead on surveys of farmers' intentions and modelling. As the implications of decoupling are multifaceted, no single methodological approach was considered to be able to address all aspects of the issue and a multiplicity of complementary approaches were therefore 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 to various 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, in that order.

Analysed policy scenarios

The assessment was done by comparing the impacts of different policy scenarios. The *actual* decoupling schemes implemented in each MS have been compared to a:

- i) Reference scenario that constitutes a hypothetical continuation of the previous AGENDA 2000 policy framework (i.e., the previous coupled direct payments are assumed to remain unchanged over the evaluation period, 2005-13), and
- ii) A hypothetical Bond scheme where the SFP is linked to the farmer and not to land. The objective of this more radical scenario was to test the implications of removing the GAEC land management obligation for collecting decoupled support.

The impacts of the current exceptions from the general principle of decoupling (partial decoupling) were also analysed. In the 2003 reform many countries chose to keep some direct payments coupled to production, which was allowed to a limited extent. Only France and Spain used the possibility of keeping direct payments partially coupled to production for all product categories where this option was available. In contrast, only Germany, Ireland, Greece, Italy and the United Kingdom decided to decouple all payments (almost) completely. Within the group of New Member States (NMS) most countries opted for highly coupled so called top-ups for cereals, oilseeds, protein crops and ruminants.

The reference scenario with coupled payments is different in the EU-15 than in the NMS, since the support schemes preceding the 2003 reform were different. The reference scenario in the NMS represents therefore a hypothetical continuation of the coupled support schemes existing prior to the EU accession, i.e. pre-accession.

Survey based analysis of farmers' intentions

Predicting the impacts of radical policy change when no historical data are available, as was the case when IDEMA started, is naturally a challenging task. One solution is to ask those who will be affected, the farmers, what they intend to do. 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 merely 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 and so forth?

Surveys have both advantages and disadvantages. They provide insights without *a priori* assumptions and give good insights into farmers' business confidence (Thomson & Tansey, 1982). Opinions whether surveys are good predictors of actual behaviour of farmers are, however, mixed. Some authors provide evidence that in the short-run farmers actually implement their intentions (Harvey, 2000; Tranter *et al.*, 2004). According to others, a survey response constitutes a weak predictor of their 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-accession or SFP-system era in five MS (France, Lithuania, Slovakia, Sweden and the UK). The choice of countries incorporates a mix of EU-15 and NMS. To understand the specific effects of the switch in policy, farmers were asked to state their intentions

under two main policy scenarios. This would in particular allow comparing farmers' intentions holding everything else but the policy reform constant. The two policy scenarios considered were:

- a) Continuation of policies under **Agenda 2000 in EU-15** and continuation of **pre-accession policies in NMS**. This provided the baseline scenario for what farmers would have done if the previous policy environment 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 the economic performance and structural characteristics of farms, IDEMA survey data was matched to Farm Accountancy Data Network⁵ (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, that 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 between February and 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).

Farm survival and growth

Understanding the determinants of farm survival or exit is critical for capturing the forces of structural change in agriculture. The determinants of exiting/staying under the different policy scenarios was investigated to assess what the main factors behind an intention to exit from farming were, and to understand which factors were recurrent and which varied with the policy environment. This was done using a Probit model 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.

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

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 revealed through a Probit model contrasting the farmers intending to grow to the rest of the respondents.

Results show that younger farmers are more likely to grow, but farm size seems to have no impact on growth intentions. Better performing farms are 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.

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 SFP arrangements compared to what they would have done if they faced a continuation of the Agenda 2000 policy environment. Under both scenarios the key characteristics of farmers seeking 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 are not planning to change their output mix, some intend to decrease their cattle production) and to a certain extent diversification to off-farm activities. Therefore, this early empirical research suggests that in England the adjustments to the 2003 CAP reform are likely to be subtle and to concern mainly production activity 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 intend to alter their plans to exit or grow as a result of the introduction of the SFP. Intentions are little affected by the switch to SFP in France, which may be expected given the conservative manner in which France has chosen to implement the SFP. Relatively greater adjustment is likely to be witnessed, however, in the output mix of farms and the allocation of time devoted to farm/off-farm work.

In contrast to England and France, in Sweden the implementation of SFP 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 intend 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 incentive to produce.

It becomes evident that farmers plan 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 intend to drastically change their strategic decisions to exit agriculture. Few farmers are 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 have sought to 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 slight contrast with this, as farmers are intending to change their exit and growth plans depending on the policy in place.

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 SFP) 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. As the returns to agricultural activities are expected 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 the CAP payments as a result of EU accession. From this point of view, the differences in responses between the EU-15 and NMS are justified 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.

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 agricultural 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 Farm Payment.

Agent-based regional modeling with AgriPoliS (Focus of Session 1 presentation)

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 the opposite occur? An important part of the IDEMA project has been the use of modelling to study the impact of decoupling on agricultural structural change. This has been done for selected regions of the enlarged EU. The methodological framework we 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 data derived from farm accounting 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 the diversity of farming in Europe with regard to factors such as farming structure, production patterns, factor use and farm size. 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).

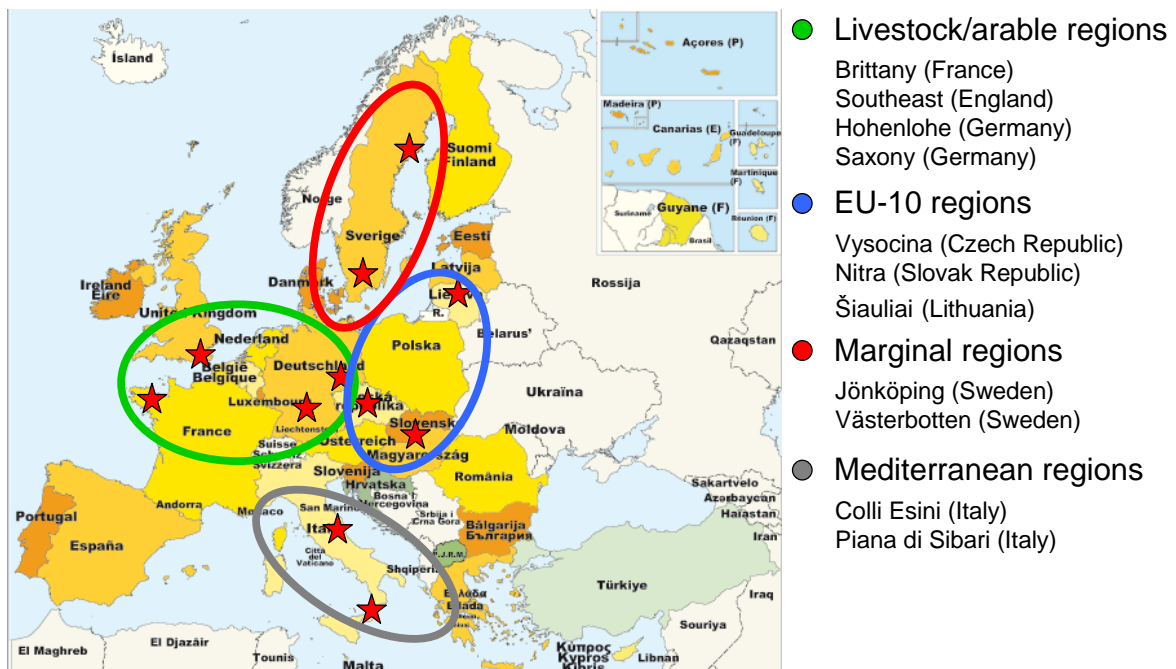


Figure 1. Location of the case study regions.

Source: Sahrbacher *et al.* (2005).

The AgriPoliS model

The core of AgriPoliS is the understanding of a regional agricultural structure as a complex, evolving system. The key entities in the model are a population of individual farms which evolve subject to their actual present 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 their technological and political environment. 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 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 know about 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.

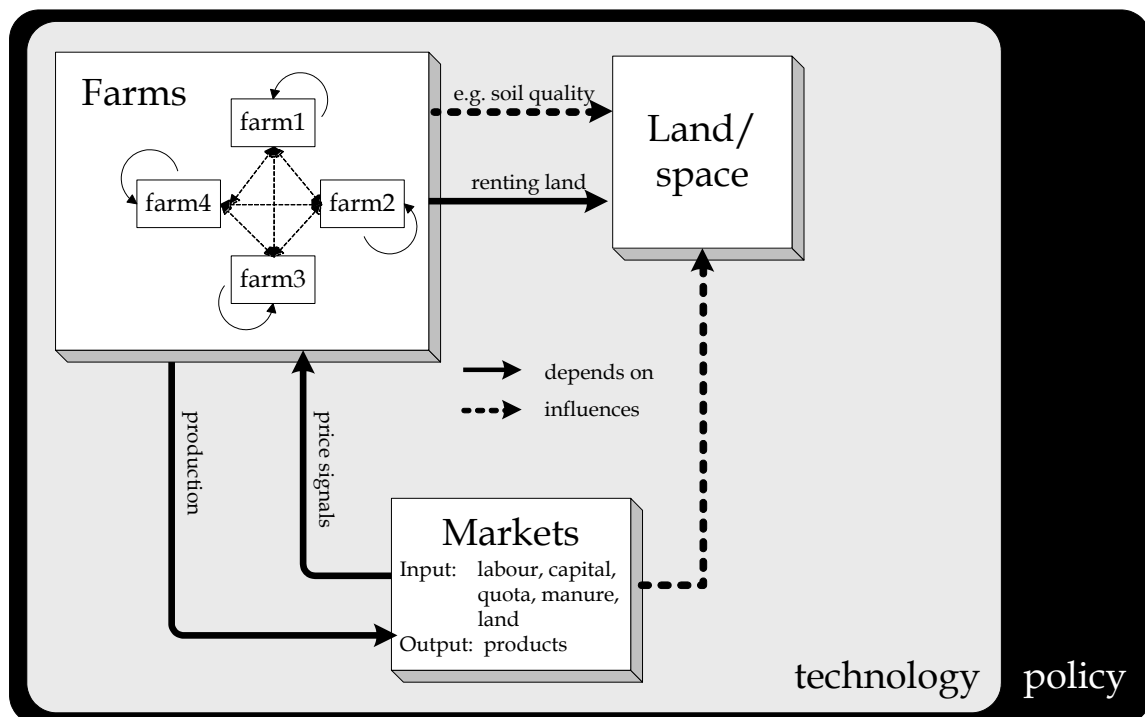


Figure 2. A conceptual model of a regional agricultural system.

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.

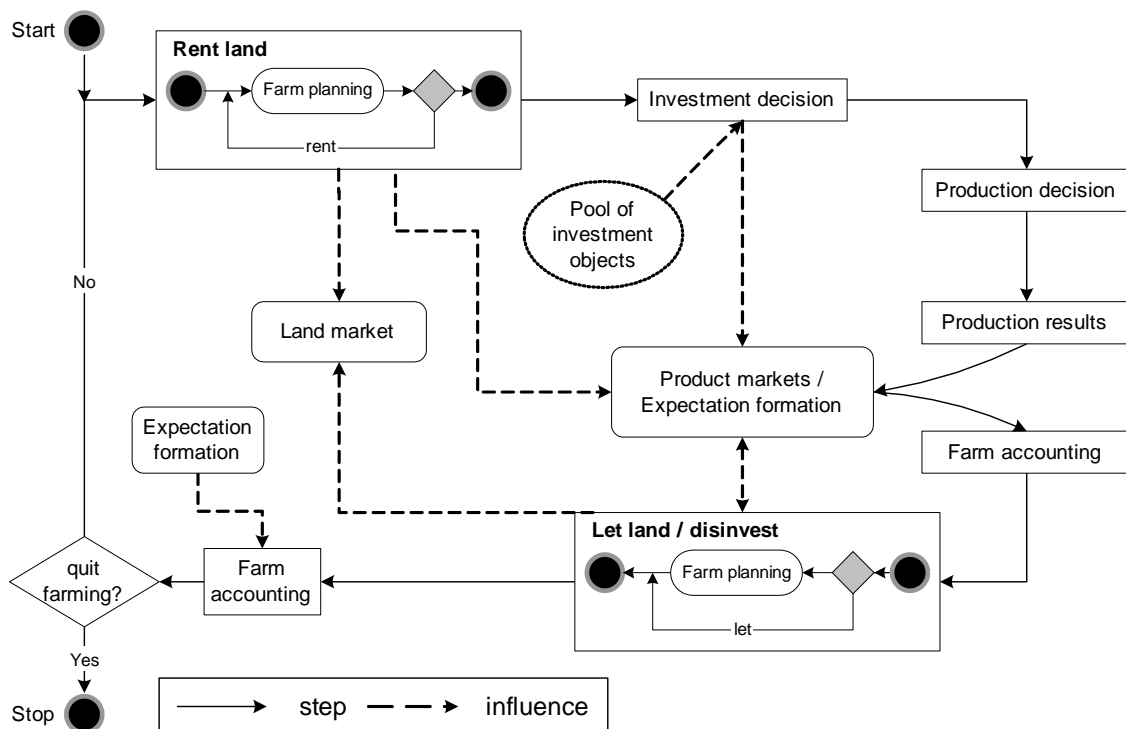


Figure 3. Course of events in one planning period for one farm agent
Source: Kellermann et al. (2008)

Simulating landscape evolution

Spatial representation in AgriPoliS is by a 2-dimensional grid of equally sized cells or plots (Happe 2004). 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);

- 1) The ownership layer denotes the ownership or rental of a specific plot.
- 2) The soil layer reflects the distribution of any number of different land or soil quality types, which determines what types of (endogenous) agricultural land use are feasible on a plot.
- 3) The block layer replicates the distribution of contiguous areas of a particular land type that are separated from land of the same type, by either another land type or physical borders that are protected through say legislation (e.g. hedge rows, ditches, roads, etc.), and hence, for all intensive purposes, can be assumed to be permanent boundaries that are not affected by agricultural policy.
- 4) The allocation layer represents the allocation of plots to farms and reflects farmers' land rental decisions (referred to as farm-blocks).
- 5) The fifth layer reflects a farm's cropping decisions, i.e. a field comprising a number of contiguous plots used for a particular activity (e.g. wheat).

Consequently the modelling framework can simulate from policy to individual farms and changes in cropping patterns at the plot level based on farm-agent behaviour.

In this idealized representation all land uses other than agricultural such as forest, lakes, urban, etc. are subsumed into a single plot type: non-agricultural land. This abstraction is based on the assumption that only agricultural land use is affected by changes in agricultural policy, and thus all other features of the landscape remain unchanged. A further simplification is that AgriPoliS models landscape synthetically, rather than as the actual location of farms and land on the ground. Using a landscape calibration algorithm, AgriPoliS generates a statistically similar landscape based on the size distribution of agricultural blocks and non-agricultural land in the region. This approach captures some important characteristics of the actual landscape (field size distribution and fragmentation) while other characteristics are ignored (field shape).

For the case-study regions, relevant landscape data was obtained via each MS's Integrated Administration and Control System (IACS) or equivalent for monitoring farmers' applications for CAP support. These systems contain, at a minimum; block boundaries, fields within blocks and the crop grown on each field which is sufficient to initialise a synthetic landscape in AgriPoliS (using histograms, means and variances of the distributions of block size by land type, see Table 3 below).

Policy scenarios

The AgriPoliS simulations were run over a 13 year period to 2013 (the end of the current programme period). We considered four policy scenarios in both EU-15 and EU-10, these being:

- A continuation of Agenda 2000 beyond 2004 in EU-15 (i.e. the old policy with coupled payments) and pre-accession policy continued beyond 2004 in the NMS. This is the reference scenario and referred to as **AGENDA**.

- The actual 2003 CAP reform, including partially decoupled payments as they were actually implemented in each individual MS (**REFORM**).
- A full decoupling scenario with fully decoupled direct payments in each member state, i.e. the option to partially couple direct payments is removed (pure **SFP**).
- A Bond scheme scenario where the Single Farm Payment for each farm is calculated as in the full decoupling scenario (**BOND**). However this Single Farm Payment is not distributed as payment entitlements per hectare, but is coupled to the farmer. The payment is granted to the farmer independent of any farming activity. Hence, the farmer can produce or choose to leave the sector but continue to receive support.

Impacts of decoupling on farming in EU-15

As already mentioned, the principle advantage with AgriPoliS is that it models structural change in space and time. AgriPoliS results show that structural change slows down due to the decoupling of direct payments in the 2003 CAP reform (Sahrbacher *et al.* 2007). Figure 4 illustrates this result; average farm size in 2013 is smaller in the REFORM scenario than with a hypothetical continuation of Agenda 2000 policies. The rationale behind this result is that particularly farms with grassland remain in the sector, because decoupled payments provide additional income opportunities. For these farms, maintaining some or all grassland in good agricultural and environmental condition (GAEC) is more profitable than off-farm opportunities.

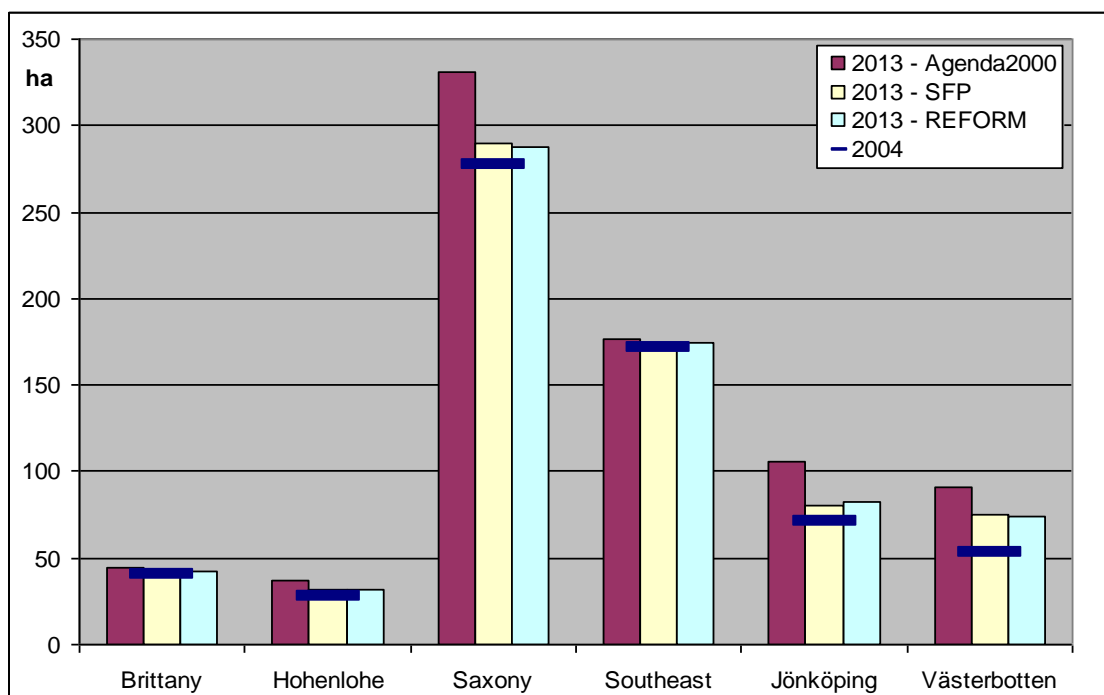


Figure 4. Average farm size in 2013 with the Agenda 2000 scenario, actual implementation of the 2003 REFORM and a full decoupling (pure SFP) scenario.

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

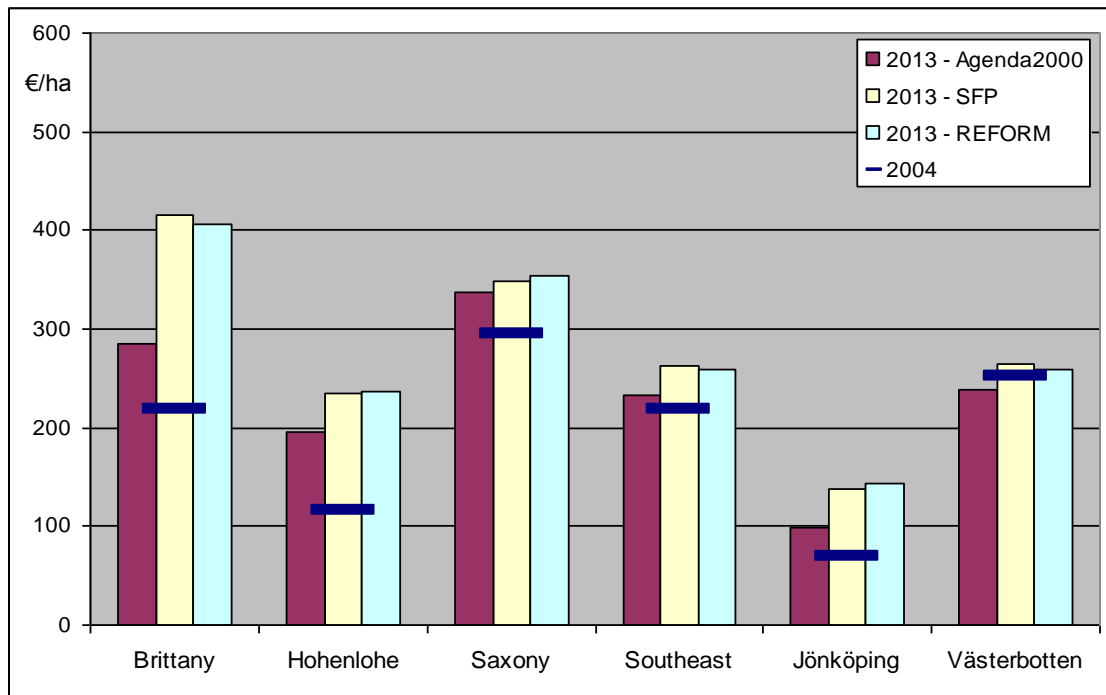


Figure 5. Average profit €/ha in 2013 with the Agenda 2000 scenario, actual implementation of the 2003 REFORM and a full decoupling (pure SFP) scenario. Source: Sahrbacher et al. (2007).

Analysing the impact of decoupling on farm income is particularly relevant, because both the former direct payments and the decoupled Single Farm Payment have the purpose of providing farmers with a stable income. AgriPoliS results show that average farm income increases due to decoupling. Income increases because decoupling gives farmers more freedom when choosing what to produce and because product prices increase (which were taken from ESIM). Figure 5 shows average profit per hectare as an indicator of farm income. Average profit per hectare is higher in all regions when direct payments are decoupled from production.

However, decoupling does not overcome the problem of capitalisation of payments in land prices. Decoupling increases arable land rental prices in Hohenlohe, Jönköping and Västerbotten. Grassland rental prices increase significantly in regions that had considerable cattle payments prior to decoupling, since cattle payments were redistributed to arable land as part of the reform, Figure 6. Rental prices in Brittany do not increase due to a regulated land market (Latruffe & Le Mouel 2006).

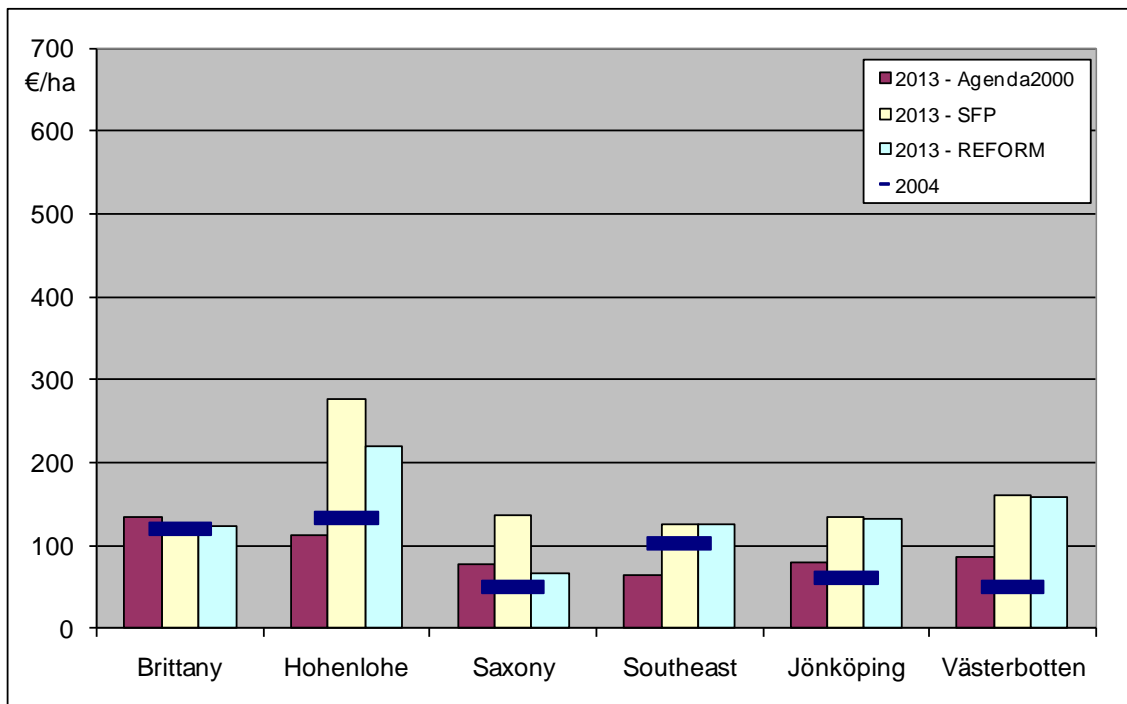


Figure 6. Average grassland rental price €/ha in 2013.

Source: Sahrbacher et al. (2007).

Impacts of the Bond scheme

The hypothetical Bond scheme scenario implies that the linkage between the SFP and land is removed, such that the payment is granted to the farmer independent of any farming activity. This scenario represents in fact a gradual phasing-out of direct payments to agriculture, since over time more and more payment entitlements will be in the hands of farmers who have left the sector.

AgriPoliS results demonstrate that the Bond scheme speeds up structural change considerably in all regions and it also leads to abandonment of agricultural land (Table 2). Further large areas of land are released to the land market by exiting farmers. However, some farms which stay in the sector also release land in the Bond scenario, but mainly in the form of grassland due to a decline in beef and milk production. Except for Jönköping, it is primarily small farms that leave agriculture in the Bond scenario.

Breaking the link between the SFP and land means that the decoupled payment will no longer be capitalised in land rental prices. Consequently, AgriPoliS results for the Bond scenario show that land rental prices fall by about 50 percent in most of the regions, Figure 7. Lower land rental prices combined with increased efficiency due to structural change compensate for payments leaving the sector due to quitting farmers. The resulting effect is higher or almost unchanged average profit per hectare, as illustrated in Figure 8.

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

	Brittany	Hohenlohe	Saxony	Southeast	Jönköping	Västerbotten
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).

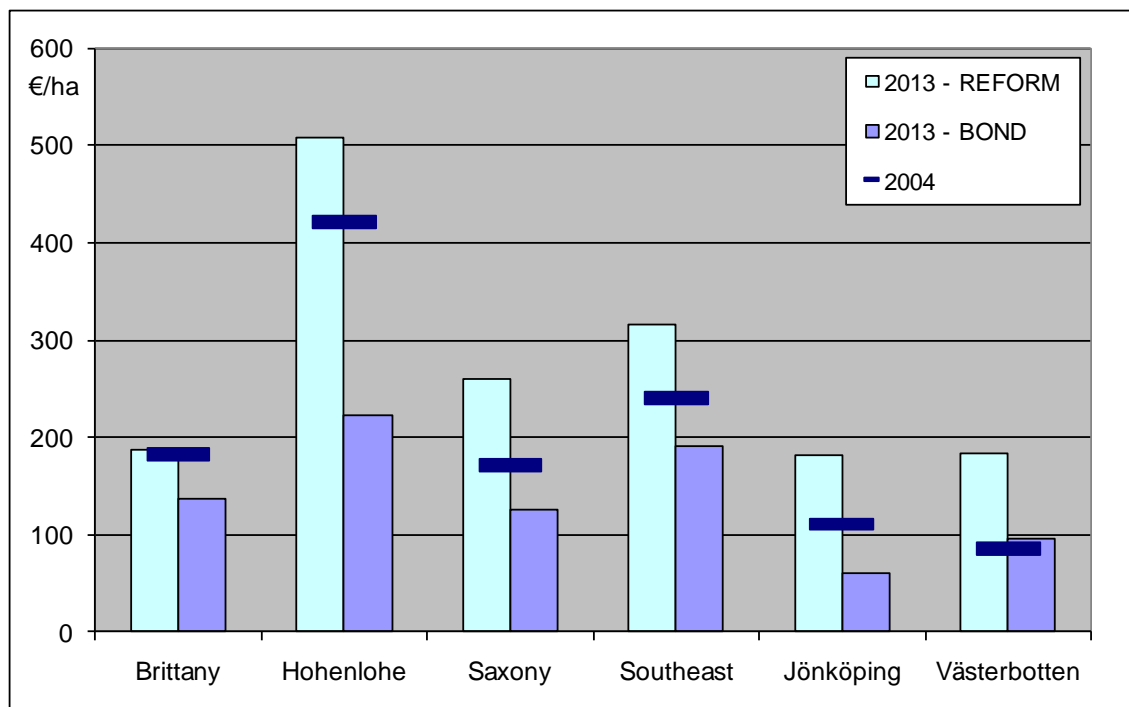


Figure 7. Average arable land rental price €/ha in 2004 and 2013 with the 2003 REFORM and the BOND scenarios.

Source: Sahrbacher et al. (2007).

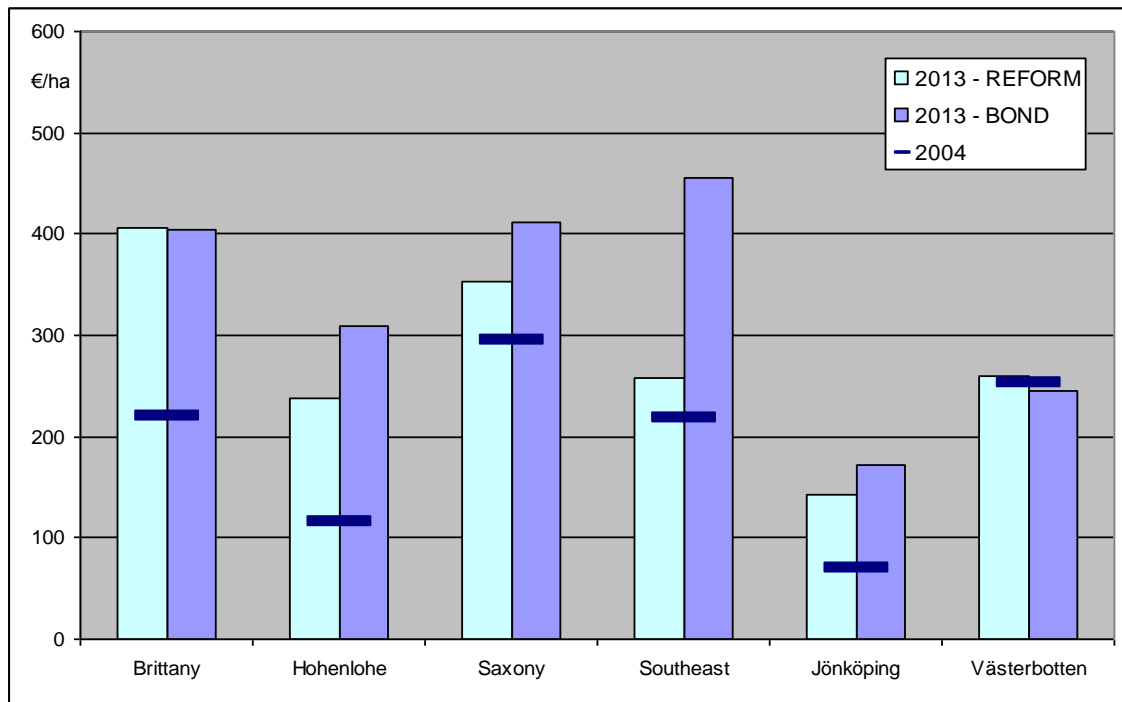


Figure 8. Average profit €/ha in 2004 and 2013 with the 2003 REFORM and the BOND scenarios.

Source: Sahrbacher et al. (2007).

Environmental impacts (Focus of Session 6 presentation)

The environmental analysis in IDEMA has mainly focused on the implications of decoupling for provision of landscape values (Brady *et al.* 2009). An important reason is that the principal environmental risk associated with decoupling is the loss of landscape values that are produced jointly or in conjunction with agricultural commodities (because decoupling reduces the level of returns to commodity production). Land abandonment, in particular, may cause landscape values to disappear. Conversely, pollution issues are of less importance because lower levels of production are not likely to increase input use and hence pollution. In addition to these reasons, there is a lack of empirical research on provisioning of landscape services, whereas pollution problems have been covered extensively.

Five case-study regions were chosen to capture some of the diversity of the EU-25. The work included development of an environmental module within the AgriPolis model (Kellermann *et al.* 2008). The principal environmental indicators evaluated were landscape mosaic and biodiversity as well as land use. The more diverse and heterogeneous a landscape, the more complex its mosaic, and hence the more it can potentially contribute to amenity, recreational, cultural and knowledge values. Hence, mosaic complexity was taken as a general indicator of landscape value. Changes in the landscape mosaic are measured using Shannon's Diversity Index (SDI). According to this indicator mosaic value increases, compared to the baseline, if the area of a relatively scarce land-use increases, and decreases if the area of a relatively common land-use increases. For any given number of land uses, there is a maximum possible diversity, which occurs when all land uses are present in equal area.

To measure biodiversity we draw on the *species-area* relationship—one of community ecology's few genuine laws—which defines the relationship between the expected number of species and habitat area (Rosenzweig, 1995). According to this index *any* reduction in habitat area will be negative for its contribution to biodiversity value—which follows common perception—but the strength of the impact will depend on the relative *scarcity* of the habitat and its species productivity. A relatively large reduction in a common habitat would, in other words, imply a relatively small reduction in biodiversity value, whereas a marginal decrease in relatively scarce, productive habitat would imply a relatively large loss in value. The net impact of decoupling on biodiversity value could therefore be either positive or negative depending on the marginal biodiversity value of competing habitat in a region (e.g. grassland vs. arable crops). In the evaluation we use the number of threatened or red-listed species supported by a particular agricultural habitat as a proxy for habitat value (i.e. the number of unique or rare species supported by the habitat).

Regions selected for environmental assessment

Selection of the regions for environmental assessment focused on the following characteristics: agricultural (North/South); socio-economic (high /low income); mode of operation (intensive/extensive); scale of operations (small/large farm); and legal form (private/corporate). Further, because decoupling is more likely to have significant landscape effects in marginal regions—due to commodity production becoming unprofitable on the margin—we biased selection away from the most competitive agricultural regions. Table 3 provides an overview of farm and landscape structure in each region.

Table 3. Farm and landscape structure of selected regions

Indicator		Sweden		Italy		Czech Rep.
		Jönköping	Västerbotten	Marche	Calabria	Vysočina
Total UAA [§]	ha	134,216	74,414	49,082	29,176	393,726
Lower limit on farm size [#]	ha	2 ha	2 ha	All farms	All farms	1 ha
Number of farms	nr	3,824	2,506	5,785	10,626	3,433
Average farm size	ha	35	30	8.5	2.7	114
Grassland area	UAA	82 %	80 %	2 %	5 %	21 %
Livestock density	LU/ha	1.1	0.8	1.6	0.9	0.8
Normal yield (Barley)	t/ha	3.5	2.3	4,1	-	5.2
Milk yield per cow	kg/year	9,000	9,000	n/a	7,260	6,175
Landscape structure						
Share of agricultural land		14 %	n/a ⁺	85 %	85 %	77 %
Median block size	ha	1.41	1.48	0.32 [*]	0.85 [*]	10.63
Mean block size	ha	1.76	2.23	0.71	2.05	19.26
CV block size [⌘]		1.27	1.36	1.61	1.87	1.26

§ Utilisable Agricultural Area. # Minimum area of land to be defined as a farm in statistics.

+ Concentrated along river valleys. * Arable land only. ⌘ CV or Coefficient of Variation as indicator of variability in block size.

The criterion South implies Mediterranean, which is represented by the two Italian regions, Marche and Calabria. These and Vysočina in the Czech Republic, are low income regions with poor employment opportunities outside of agriculture. Intensive regions are defined by high input levels per ha land (e.g. labour, nutrients and chemicals). The Mediterranean regions are the most intensive followed by Vysočina. The two Swedish regions, Jönköping and Västerbotten, are considered extensive because the share of semi-natural grassland is high and livestock density low (Table 2). Milk yield per cow is though relatively high. These regions also provide contrast with respect to the various Pillar II instruments of the CAP and how they might interact with the SFP. Jönköping has a large area of semi-natural grassland that is important for conservation of biodiversity and its mosaic of arable land adds value to a landscape otherwise dominated by spruce forest. In contrast farmers' in Västerbotten are entitled to complementary national support coupled primarily to milk production (at 0.10 €/kg).

Vysočina is typical of landscape degradation in NMS and the urgency of environmental problems (Jelinek et al., 2007). Extreme expansion and amalgamation of fields under the Communist era has resulted in large fields (frequently > 100 ha) that are both erosion prone and increase the risk of flooding. Much of the historical mosaic and species rich habitat such as pasture was also destroyed. Mediterranean landscapes on the other hand are characterized by perennial crops and small fields (0.5-2 ha) which contribute to a mosaic considered integral to tourism. Farms are also small on northern European standards but produce higher value products such as grapes, olives, fruits and vegetables. Calabria has conditions and an output mix (fruits and olives) that are similar to those found in Spain and Greece. Marche has features closer to continental agriculture having a mix of arable crops and wine-grapes.

Impacts on landscape mosaic

The impacts of decoupling on landscape mosaic are summarized in Figure 9 using Shannon's Diversity Index (SDI). Each column shows the change in mosaic compared to the observed situation in 2004. A negative value indicates that mosaic has deteriorated (i.e. become more homogenous) which is most pronounced for all scenarios in Jönköping and Västerbotten. In these extensive regions the 2003 REFORM leads to a significant reduction in the area of grain and grass-fodder, yet the GAEC condition ensures that land is not abandoned, and hence avoids the larger deteriorations in mosaic occurring under the BOND (which is analysed further below). Nevertheless mosaic deteriorates compared to AGENDA because managing land according to minimum GAEC results in an increase in the area of the dominating land use, grass. In this sense the SFP provides an incentive to homogenize the landscape in extensive regions. Mosaic declines less in Västerbotten compared to Jönköping because national milk support buffers the potential effects of decoupling on production.

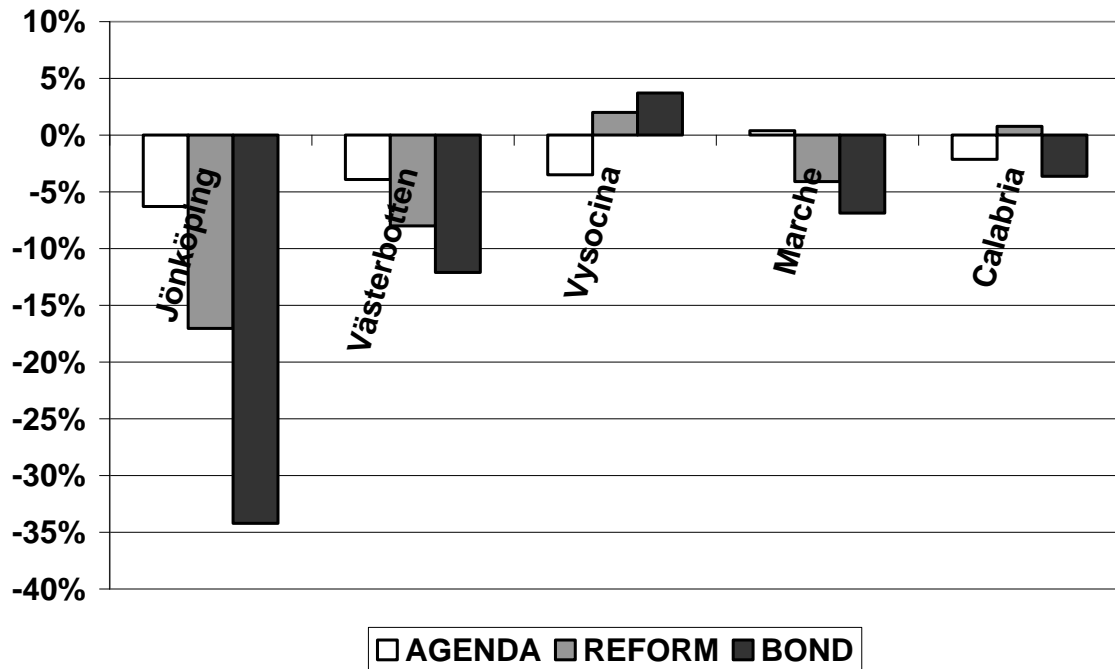


Figure 9. Change in landscape mosaic in 2013 compared to 2004 (Shannon's Index)
Source: Brady et al. (2009).

In regions where cultivation of crops remains largely profitable after decoupling (Czech and Italian regions) it causes a small negative to positive impact on mosaic depending on the regional crop mix, and consequent substitution effects between common and less-common crops. Mosaic improves in Vysočina as a result of REFORM (i.e. accession) because the area of grain declines—the dominating crop type in 2004—and the area of less common fodder crops increases, due to an increase in the relative profitability of intensive beef production. Mosaic improves further under the BOND scenario due to increased crop diversification, which indicates that the GAEC obligation is redundant in this region for maintaining landscape. AGENDA (i.e., pre-accession) on the other hand results in a slightly larger area of grain and hence reduced mosaic.

In the Mediterranean the REFORM results in fairly small but contradictory effects on mosaic due to region specific changes in the crop mix. The BOND scenario shows a somewhat larger reduction in mosaic in Marche due to reductions in the areas of durum wheat, sugar beet, sunflower and silage crops, and in Calabria due to reductions in soft wheat and olives. This implies that continued production of these crops was the most cost-effective way to fulfil regional GAEC requirements according to the model. Overall the effect of the GAEC obligation on mosaic in Vysočina and the Mediterranean is fairly small since market prices are sufficient to maintain most land in commodity production. Instead some substitution between crops occurs, the effects of which are crop and region specific.

Figure 10 shows the resulting areas of Set-aside, GAEC and Abandoned land for the applicable scenario, relative to the regional agricultural area in 2004. In focus here is the area of land abandoned under the BOND (Theoretically no land should be abandoned due to the REFORM because of the GAEC obligation). To begin with note that under the BOND only a very small area is abandoned in Vysočina and nothing in Marche, despite relatively large areas of GAEC appearing in response to the

REFORM. This is because the areas of GAEC shown in Figure 10 mirror, approximately, the historical area of obligatory set-aside that still needed to be maintained at the time of the 2003 reform, rather than representing voluntary idling of land by farm-agents (NB this requirement has recently been waived by the EU in response to rising global food prices). Consequently, the areas of Set-aside/GAEC in these regions are used in commodity production when farm-agents are given full freedom to choose land use under the BOND.

Land abandonment of sharply varying degree is shown to occur in the other regions. In Calabria a relatively small area related to olives is abandoned under the BOND which, as shown below, has potentially significant implications for biodiversity. The most substantial effects, as expected, occur in the extensive regions of Jönköping and Västerbotten. Somewhat surprising might be that the area abandoned is much larger than the area of GAEC, especially in Jönköping, which should reflect the area of land not profitable to farm in market terms. This occurs in the model because semi-natural grassland is required to be grazed by ruminants according to the Swedish GAEC obligation (a relatively costly obligation that mimics agri-environmental schemes), but which is eliminated in the BOND scenario. Thus this result reflects the stringency of the Swedish GAEC obligation rather than the profitability of commodity production (at market prices) after the 2003 reform. Such wide-scale abandonment would be very negative for landscape value according to our indicators and even for biodiversity (see below). In other words, it might be motivated to strengthen agri-environmental schemes—currently ranging from €100–275/ha managed grassland and as represented in the model—under a Bond alternative in these regions (depending on public willingness to pay for landscape preservation).

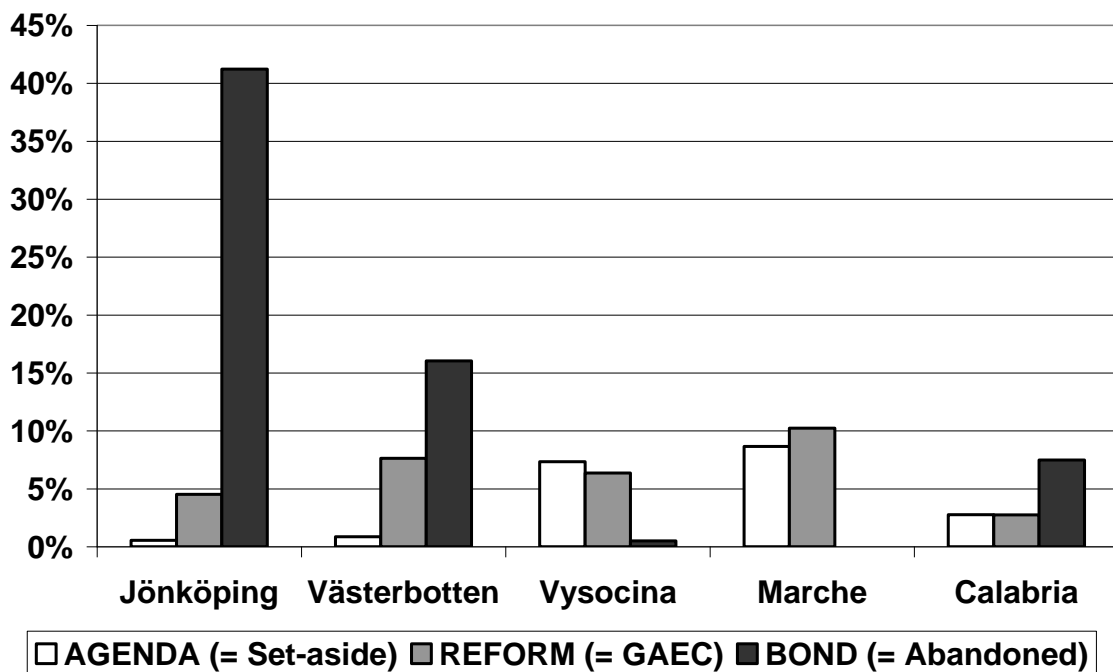


Figure 10. Area of Set-aside, GAEC or Abandoned land in 2013, relative to total agricultural area in 2004.

Source: Brady et al. (2009)

Impacts on biodiversity

Impacts on biodiversity are shown in Figure 11 to vary substantially between regions and policy scenarios, and to differ substantially from the policy impacts on mosaic. We therefore analyse impacts on biodiversity region by region. For Jönköping the REFORM has little impact on biodiversity, unlike the impact on mosaic. This result is primarily attributable to the similarity, as described above, of the GAEC obligation and agri-environmental schemes for semi-natural grassland. Despite a significant decline in modelled beef output under the REFORM due to decoupling of headage payments, farm-agents reorganise livestock holdings to minimise the cost of landscape management by raising more sheep and less fat cattle. As indicated above only 49 % of the semi-natural grassland area is preserved in Jönköping under the BOND (i.e. in absence of the GAEC obligation). Additional simulations indicate that this proportion would fall towards zero if agri-environmental payments were also eliminated. In this sense Pillar II payments act to buffer the landscape impacts of decoupling, but not entirely. The substantial decline in mosaic (36 %) and land abandonment (41 %) in Jönköping under the BOND does not, however, translate into a proportional reduction in biodiversity; a result of the diminishing marginal productivity of habitat. As shown in Figure 11 biodiversity falls by a lower 15 % according to our indicator (which itself is potentially serious as it represents the loss of around 26 red-listed species).

Impacts on biodiversity were similar across all scenarios for Västerbotten because coupled Pillar II national support, which remains unchanged, buffers the impacts of decoupling on production. Since arable grassland is the dominating habitat in this region, the reduction in area under the BOND (-16 %) has only a marginal impact on biodiversity (i.e. marginal biodiversity value of grassland in this region is low).

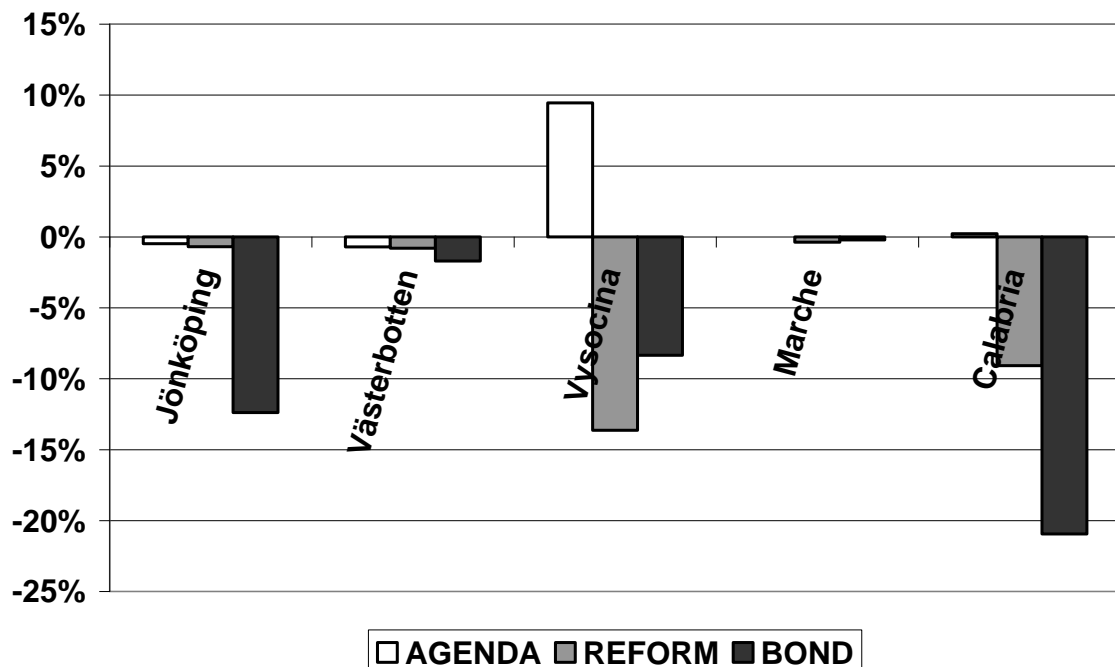


Figure 11. Relative change in biodiversity in 2013 compared to 2004 (i.e. percentage change in number of species).

Source: Brady et al. (2009)

Reduced biodiversity in the decoupling scenarios for Vysočina might seem inconsistent with the corresponding improvements in mosaic shown in Figure 9, since land use diversity is generally supposed to be important for maintaining biodiversity. The primary driver of biodiversity in this region is the area of pasture. Pasture is not only the ecologically most productive habitat but is also scarce, which translates into high marginal biodiversity value according to the species-area relationship. As such, even a small reduction in the area of pasture causes a relatively large reduction in biodiversity. In terms of mosaic, the reduction in pasture area is compensated for by increased diversity of arable crops. Continuation of AGENDA (i.e. pre-accession) results in increased biodiversity because it favours suckler/extensive beef production (due to lower payment levels) and hence a greater area of pasture. Perhaps surprisingly, the BOND is better for biodiversity than the REFORM. This result is due to two complementary effects; an increase in the relative profitability of suckler beef production which requires pasture, and the 110 €/ha agri-environmental payment to pasture/grassland maintained in this scenario. Hence pasture area and biodiversity decrease relatively less compared to the REFORM that is more favourable to intensive beef production.

For Calabria both decoupling scenarios result in reductions in the area of managed olive plantations which translates into a reduction in biodiversity value associated with perennial habitat in this region (Note however that we have not been able to investigate more deeply the ecological consequences of ceasing to manage perennial crops but assume habitat loss). A similar effect was not found for Marche because of the relatively small area of olives. Reduced mosaic value for Marche under the BOND did not translate to lower biodiversity value because different arable crops in the region were assumed to have equivalent habitat value (i.e. can substitute for each other). Since the total area of arable habitat remained unaffected by decoupling, so did biodiversity value according to our indicator.

The modelled losses in biodiversity in Vysočina and Calabria illustrate the problem of having a minimum land management obligation when biodiversity is dependent on preserving specific habitats. Even though agricultural activity is maintained, important habitats might still be lost, denying the general proposition of joint production between farming and the environment.

Decoupling and implications for agricultural landscapes

Our results demonstrate that eliminating the link between support payments and production can have negative consequences for the landscape, but only under particular circumstances. Decoupling would—in some regions—have resulted in land abandonment, and hence even greater loss in mosaic and biodiversity value, if it were not for the obligation to maintain land in good environmental and agricultural condition (GAEC), which ensures that land taken out of production continued to be managed for conservation.

The GAEC obligation, however, (at least as modelled here) did not prove to be a sufficient measure to avoid all the environmental consequences of decoupling. Since GAEC represents a minimum management requirement, the SFP provides an incentive to homogenize land use—grow more grass—in extensive regions, which has negative consequences for mosaic compared to continuing Agenda. Further the GAEC obligation

needs to mimic existing agri-environmental schemes to preserve biodiversity values associated with semi-natural grasslands (i.e. require grazing by ruminants). In more competitive/intensive regions (Mediterranean and Czech), GAEC is generally redundant since market prices are sufficient to keep land in commodity production and hence meet payment obligations. Environmental outcomes of decoupling are, as a result, capricious in these regions depending on the regional characteristics. Under these circumstances the SFP merely raises land rents without contributing to environmental quality. In the Czech region where the intensity and scale of arable farming is clearly detrimental to landscape value we found nothing in the design of the GAEC obligation that provides sufficient incentive to improve the situation. On the contrary, things became worse for biodiversity; GAEC is after all a minimum use requirement and hence does not prevent over use.

Our results imply that the SFP has serious weaknesses as a means of procuring environmental stewardship, which is also supported in theory. Any flat-rate payment scheme—as the SFP clearly qualifies—will be inefficient when either the costs or benefits of environmental provisioning are heterogeneous (Fraser, 2009). Under these circumstances, cost-effectiveness calls for spatially differentiated environmental policy instruments (Wätzold and Drechsler, 2005). Insufficient flexibility is available under the stipulations of Pillar I support to manage environmental quality (by definition a common policy). Further, the more stringent environmental obligations associated with GAEC might become the higher the costs for farmers and the less the SFP will support farm incomes, the overriding goal of direct support. More efficient (and effective) environmental schemes are needed to match the local requirements for conservation and landscape enhancement than is provided by the SFP.

Conclusions

The IDEMA project has analysed impacts of decoupling EU agricultural support from production. Both the 2003 CAP reform and a more extreme Bond scheme have been analysed. The central element in the 2003 reform is the introduction of the Single Farm Payment (SFP) which is linked to land but decoupled from production. With the hypothetical Bond scheme there is no link between the decoupled payment and land management, as a farmer still receives the decoupled payment even if they leave the agricultural sector.

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 this.

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 make farmers in the NMS less interested in diversification.

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 coupled direct payments. There is no strong evidence that farmers intend to drastically change their strategic decision to exit agriculture. In fact, model results indicate that structural change slows down when direct payments are decoupled. Another finding is that the decoupled payments may reduce farmers' off-farm labour supply.

In the NMS the impact of EU accession dominates the effects of decoupling: the introduction of CAP payments results in a greater willingness to stay in farming and greater competition for land. Increased payments are capitalised in higher land (rental) prices.

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 production in less productive, high cost regions. The greatest impacts of decoupling occur in the beef and sheep sectors, particularly in regions with high production costs. Individual MS decision to partially couple payments to production has a marked influence on beef and lamb supply.

Decoupling leads to reduced supply of cereals, oilseeds, beef and lamb at the EU level, which increases market prices of these products (Balkhausen & Banse 2006).

Bond scheme

It is clear that the existence of a link between payment entitlements and land is crucial for the impact of a decoupling policy. Model results show that a Bond type of decoupled payment leads to 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 unchanged or even higher under the Bond scheme, due to significantly lower land (rental) prices and faster structural change in this scenario. The Bond scheme leads however to abandonment of agricultural land (the level of which varies between 1–31 % of total agricultural area depending on the region).

The impact on livestock production varies between countries, depending on the partial coupling choices made under the 2003 CAP reform. Livestock production decreases mainly in countries which chose to use coupled beef and sheep payments under the 2003 reform. However, lower supply due to further decoupling of support also means higher product prices for these products.

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.

Environmental effects

The environmental assessment indicates that decoupling impacts are least in relatively productive regions with favourable conditions for agriculture, because most land

continues to be used in commodity production. In marginal regions with relatively high production costs, decoupling has a negative impact on both landscape mosaic and biodiversity, because decoupling leads to homogenisation of land use (due to land being taken out of production and “simply” maintained in *good agricultural and environmental condition*). However existing agri-environmental schemes and national support were shown to buffer to great degree the full potential impacts of decoupling direct payments. The 2003 CAP reform, by breaking from production orientated support, paves the way for a future agricultural policy that is truly committed to environmental objectives. The SFP is though not generally justified as an effective or efficient environmental instrument.

Final remarks

The 2003 CAP reform intended to make European agriculture more competitive and market-oriented, and at the same time provide support to farmers with less distortion on production and trade. It can be asked whether the results of the IDEMA project indicate that 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 any dramatic way. At the same time it can be argued that the objective of improving competitiveness has hardly been achieved due to slower structural change and higher land prices which follow 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 less costly solution for society is to gradually phase out the Single Farm Payment and instead use targeted support to preserve landscape and environmental values linked to agricultural activities.

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