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ANALYSIS OF THE 2003 CAP REFORM

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ANALYSIS OF THE 2003 CAP REFORM

1. Introduction

The Council of Agricultural Ministers of the European Union (EU) reached agreement, in Luxembourg on 26 June 2003, on a reform of the Common Agricultural Policy (CAP), based on the Commission proposals presented on 23 January 2003 (CEC, 2003a). This report contains an analysis of that reform, based on information available at the end of September 2003 (CEC, 2003b). It sheds light on the implications of the proposed changes, compared to a continuation of policies in place or planned under Agenda 2000, on the current 15 EU Member States in terms of production incentives, market developments and levels of support, using information and tools available in the Secretariat. It also attempts to provide an overall evaluation of the reform in light of OECD Ministerial principles for agricultural policy reform (OECD, 1998). The main elements of this analysis will be included in the 2004 edition of the *OECD Agricultural Outlook*.

The analysis presented here treats the EU as an aggregate of the current EU-15 Member States. However, on 1 May 2004, ten additional countries will join the EU. They are not considered in this analysis because the counterfactual situation (the CAP as applied in 2002 or planned under Agenda 2000) has never been and will never be implemented in these countries. Enlargement, with the introduction of the reformed CAP in acceding countries, will, however, have an impact on market developments in all past and future member countries. Provisions for CAP implementation in the 10 new members and estimated market impacts from published sources are summarised in Box 1.

EU governments gave careful consideration to the implications of enlargement for CAP expenditures. They agreed that between 2007 and 2013 the overall ceiling for CAP expenditures under the Common Market Organisations (first pillar), for the 25 countries will rise by no more than 1% per year in nominal terms from the 2006 level. Once this ceiling is reached (including a margin of some EUR 300 million) a “financial discipline” mechanism will automatically reduce the level of direct payments. However, although expenditures on the Rural Development Regulation (RDR) measures (second pillar) are not affected by this Agreement, expenditures are strongly limited by the six-year budgetary plan. These considerations do not affect the current analysis, but are likely to influence possible future CAP changes.

The main objective of this analysis is to evaluate the potential impact of the reform on land use, extensification, welfare, market developments and the level and composition of support using tools and data developed in the OECD. As indicated above, EU enlargement is not taken into account in this analysis, so all references to the EU in the text are limited to the existing fifteen members (EU-15), even when discussing events that will occur after enlargement.

Section 2 summarises the main CAP changes decided in June 2003. In Section 3, the OECD tools used in the analysis and the scenarios carried out in the different analyses are presented. Scenario results are then analysed (Section 4). Section 5 contains a qualitative analysis of aspects of the reform, which are not taken into account in the quantitative analyses. Finally, the main results are summarised and the reform is evaluated with regard to Ministerial reform principles in Section 6.

Box 1. CAP reform and the 10 Accession Countries (AC-10)

On 13 December 2002, provisions for extending membership of the EU to ten new Member States were agreed to at the Copenhagen Summit. Accession treaties were signed in Athens on 16 April 2003. The ratification process has been successfully completed in acceding states and in most of the 15 Member States. In consequence, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic and Slovenia will join the EU on 1 May 2004.

The provisions are as follows. Farmers from new Member States will have immediate access to CAP market measures, such as export refunds, and intervention mechanisms. Production quotas, reference yields and base areas have been set for new Member States based on recent historical reference periods for which data were available (for more details, see OECD, 2003b). Direct aids will be phased in over ten years. New Member States will first receive 25% of the full EU-15 payment rate from the EU budget, rising gradually to 100% by 2013. During the phase-in period, the new Member States may complement EU funds for direct payments by national contributions up to 55% in 2004, 60% in 2005 and 65% in 2006 of the full EU-15 payment rate, and, from 2007, up to 30% above the applicable phasing-in level for direct payments for the relevant year. Until 2006, the national supplementary payments can be co-financed up to 40% of payment level from RDR funds. Special provisions have been agreed to for Cyprus and Slovenia to take account of their internal support systems prior to accession. During the first three years, new Member States will have the option to grant direct payments in the form of a single area payment applied to the whole agricultural area. Details on the implementation of the reformed CAP in accession countries were still being discussed at the time this report was written.

According to analyses undertaken by researchers from the Danish Research Institute of Food Economics and by the European Commission, the impact of CAP reform on the accession countries (AC-10) will be to moderate but not reverse the changes expected in their agricultural sectors resulting from the CAP. That is, projected increases in cereals and beef production in the AC-10 are likely to occur, but will be less under CAP reform than under Agenda 2000. The same is true of production changes forecast for the EU-15. Jensen and Frandsen (2003) carried out an analysis of the impacts of EU enlargement under multiple scenarios, including Agenda 2000 and three CAP reform options. They conclude that for 21 out of 22 commodity categories in the AC-10 and 20 out of 22 for the EU-15, changes in production pre- and post-enlargement under Agenda 2000 are of the same sign as those pre-enlargement and post-enlargement under the CAP reform scenarios.

Jensen and Frandsen expect CAP reforms to be welfare-enhancing for the AC-10 and the EU-15 when compared with welfare of an enlarged EU under Agenda 2000. In fact, a predicted welfare loss of some EURO 4 billion for the EU-15 becomes a gain of EURO 1.3 billion under a maximally-decoupled CAP reform scenario. These gains result from increases in allocative efficiency stemming from decoupling of support.

A European Commission study carried out in March 2003, based on the Commission proposal for CAP reform of January 2003 (CEC, 2003c), largely supports these conclusions. Arable crop production is expected to shift towards oilseed production in the enlarged EU as a whole, as well as to soft wheat and barley, which are expected to see improved market conditions due to accession. The increase in beef production in the AC-10 resulting from accession is smaller than originally projected. Decoupling increases farmers' welfare through increases in both production efficiency and transfer efficiency when compared with Agenda 2000.

EU enlargement is expected to increase consumer income in the AC-10. The benefits of the single market, improving efficiency and trade, will promote GDP per capita convergence between the EU-15 and AC-10. This demand-side effect will alter the dynamics of agricultural markets in the enlarged EU, in particular for cereals and dairy products (CEC, 2003c). A recent study by the Commission on the medium-term prospects (2003-2010) for agricultural markets and income in the European Union (CEC, 2003d) also confirms an estimated increase in income in new Member States (35% as compared to 2002) and predicts, as of 2010, income levels in the EU-15 higher than what they would have been without the reform.

2. Summary of CAP changes

In line with the objectives of Agenda 2000 with regard to sustainable agriculture and rural development, the Commission proposes adjustments to the common market organisations for crops, beef and dairy products, as described below. Changes will be implemented in 2004 unless otherwise specified.

Adjustments to common market organisations (CMO) (summarised in Table 1)

- The intervention price for **cereals** and direct payment of EUR 63/tonne will be retained. The payment will become part of the single farm payment (SFP) in 2005. Monthly increments to intervention prices will be reduced by 50%.
- Intervention for **rye** will be abolished.
- The supplement for **durum wheat** in traditional production zones will be fixed at EUR 313/hectare (ha) in 2004, EUR 291 in 2005 and EUR 285 from 2006 (down from EUR 344.5/ha in 2002) and included in the SFP. Member State may, however, decide to keep 40% tied to production. The specific aid for other regions, currently set at EUR 139.5/ha, will be phased out over three years, starting in 2004. In traditional production zones, a new quality premium of EUR 40/ha will be provided to farmers who are using a certain quantity of certified seeds of selected varieties, within the limits of current Maximum Guaranteed Areas (MGA).
- There is no change for **oilseeds** until the area payment is integrated in the SFP.
- The intervention price for **rice** will be reduced by 50% to EUR 150/tonne, and 88% compensation will be offered through higher payments. As a result, existing payments will increase from EUR 52/tonne to EUR 177/tonne. Of this, EUR 102/tonne will become part of the single payment per farm (see below) and be paid on the basis of historical rights limited by the current MGA. The MGA will be set at the 1999-2001 average or the current MGA, whichever is lower. The remaining EUR 75/tonne will remain crop specific. Intervention will be limited to 75 000 tonnes per year.
- A new maximum guaranteed area of 1.4 million ha for **protein crops** will be introduced and the current payment per tonne (EUR 9.5/tonne) will be converted into a crop-specific area payment of EUR 55.57/ha, which will not be included in the SFP.
- A payment of EUR 45/ha will be offered to farmers who produce **energy crops** outside set-aside provisions, if the production is covered by a contract between the farmer and the processing industry concerned or if the processing takes place on the farm. It will be applied on a MGA of 1.5 million ha. The implementation of the scheme will be reviewed within five years.
- Forty per cent of the direct payment of EUR 110.54/tonnes for producers of **starch potatoes** will be included into the SFP, on the basis of historical deliveries to the industry. The remainder will be maintained as a crop specific payment for starch potatoes. The minimum price will be maintained, as will the production refund for starch.
- Support in the **dried fodder** sector will be redistributed between growers and the processing industry. Direct support to growers (EUR 68.83/tonne for dehydrated fodder and EUR 38.64/tonne for sun dried fodder) will be integrated into the SFP, based on historical deliveries. National ceilings will apply to take into account current National Guaranteed Quantities. The processing aid will be fixed at EUR 33/tonne in 2004/05.
- Supplementary payments to farmers in Nordic regions of the EU for **drying aid** will increase from EUR 19/ha to EUR 24/ha.
- Current arrangements for **nuts** will be replaced by an annual flat rate payment of EUR 120.75/ha for a maximum guaranteed area 800 000 ha divided into fixed national guaranteed areas for

almonds, hazelnuts, walnuts, pistachios and locust beans. Member States are allowed to use their guaranteed quantities in a flexible way. This aid can be topped up by an annual maximum amount of EUR 120.75/ha by Member States.

- No change in **sheep** premia until incorporation into the SFP.
- For **beef**, the number of animals to which the suckler cow premium applies will be increased by 50 000 in Austria and 139 000 in Portugal. The maximum percentage of heifers who may receive suckler cow premium is set at 40%. The number of animals eligible for the special beef premium in Austria will be reduced by 50 000. From the date of application of the SFP, the definition of calves is changed (the maximum age is raised from 7 to 8 months and the maximum carcass weight from 160 to 185 kg). Current headage payments will become part of the SFP in 2005.
- **Dairy** quotas will be maintained until the 2014/15 season. The general quota increases decided under Agenda 2000 will take place from 2006 onwards (instead of 2005) in the eleven Member States, where they remain to be applied. In these countries, quotas are to be increased by 0.5% in each of the years 2006, 2007 and 2008. In addition, milk quotas will be increased for Greece (120 000 tonnes) from 2004/05 and for the Azores (50 000 tonnes) from 2005/06 onwards. In addition, there is a temporary exemption for the Azores regarding milk quota implementation of 73 000 tonnes in 2003/04 and 61 500 tonnes in 2004/05.

The intervention price for butter will be reduced by 25% (-7% in 2004, 2005, 2006 and -4% in 2007), which is 10% more than agreed in Agenda 2000. For skimmed milk powder (SMP), prices will be cut by 15% as agreed in Agenda 2000 (but in 5% steps over three years from 2004 to 2006). The price cuts are brought forward one year compared to the Agenda 2000 plan. Intervention purchases of butter will be suspended above a limit of 70 000 tonnes in 2004, falling to 30 000 from 2007. Above that limit, purchases may be carried out under a tender procedure. Intervention will only be opened between 1 March and 31 August. The target price for milk will be abolished.

Compensation payments to milk producers are fixed as follows: EUR 11.81/tonne in 2004, EUR 23.65 in 2005 and EUR 35.5 from 2006 onwards. The SFP will only apply in the dairy sector once the reform is fully implemented (*i.e.* 2007), but Member States may decide to introduce it earlier (from 2005) in the context of a regional implementation of the SFP.

- No changes were made to the common market organisations for other commodities such as sugar, olive oil, wine, tobacco, etc. However, in autumn 2003 the Commission made proposals on the reform of the olive oil, tobacco, cotton, and hops regimes, and outlined options for the sugar regime.

Table 1. Selected changes in policy parameters from 2003

Commodities	2003	2004	2005	From 2006
Durum wheat:				
- Supplementary payments				
in traditional areas (EUR/ha)	344.5	313	291	285
in other areas (EUR/ha)	139	93	46	0
- Quality payment (EUR/ha)	0	40	40	40
Rice:				
- payment (EUR/t)	52	177	177	177
Protein crops:				
- supplementary payment (EUR/t)	9.5	0	0	0
- supplementary payment (EUR/ha)	0	55.57	55.57	55.57
- MGA (million ha)	n.a.	1.4	1.4	1.4
Dried fodder:				
- payment for dehydrated fodder (EUR/t)	68.83	33	33	33
- payment for sun dried fodder (EUR/t)	38.64	33	33	33
- payment to processors (EUR/t)	0	33	33	33
Drying aid (EUR/ha)	19	24	24	24
Nuts :				
- EU payment (EUR/ha)	0	120.75	120.75	120.75
- maximum national payment (EUR/ha)	0	120.75	120.75	120.75
- MGA (million ha)	n.a.	0.8	0.8	0.8
Energy crops:				
- payment (EUR/ha)	0	45	45	45
- MGA (million ha)	n.a.	1.5	1.5	1.5
Beef and veal:				
increase in ceiling (a)				
- Suckler cow premium (%)	0	1.75	0	0
Dairy:				
- change in intervention price for butter (%)	0	-7	-7	-7 (b)
- change in intervention price for SMP (%)	0	-5	-5	-5 (b)
- payment per tonne of quota (EUR/t) (c)	0	11.81	23.65	35.5
- quota (million tonnes) (d)	118.893	119.013	119.063	119.544

Notes

n.a.: Not applicable. Payments that are not included in this table have not been changed.

a. 50 000 additional animals in Austria and 139 000 in Portugal, or a 1.75% increase in the total number of animals eligible for suckler cow premia in the EU. The number of beef heads eligible for the special beef premium in Austria is reduced by 50 000 but it is assumed the ceiling will remain unbinding so the payment level is not changed.

b. Further 4% decrease in 2007 for butter. Final year for the implementation of reduction for SMP.

c. Including additional dairy payments.

d. Additional quota of 120 000 t to Greece from 2004/5; temporary quota exemption of 73 000 tonnes in 2003/04 and 61 500 tonnes in 2004/05 in Portugal; additional quota of 50 000 tonnes to Portugal (the Azores) from 2005/06; additional 0.5% to 11 Member States (4.1% in the overall quota) for 2006/07, 2007/08 and 2008/09 given that the planned increase in quota is postponed from 2005 to 2006. Quota level is therefore 120.024 million tonnes in 2007/08 and 120.505 million tonnes in 2008/09.

Source: CEC (2003b) and CAP Monitor.

Single payment scheme

A single farm payment will replace most of the existing premia under different Common Market Organisations. Farmers will be allotted payment entitlements based on historical reference amounts received during the period 2000-02. The payment can be established:

- at the farm level. The entitlement will be calculated by dividing the reference amount of the payment by the number of eligible hectares (including for forage area, which is the basis for the granting of livestock and sheep and goat premia) in the reference year.
- at the regional level as follows:

- calculate and allocate a uniform payment entitlement per hectare within a region, rather than calculate a single payment individually for each farmer;
- vary payment levels between arable land and grassland;
- make different sectors contribute to different degrees to the redistributed regional envelope while allocating some payments or a given share of payments on the basis of individual reference amounts; and
- redistribute funds between regions when the regional financial envelopes are defined.

Member States with less than 3 million hectares of eligible land can consider their territory as one region and therefore opt for a national “regionalised” implementation.

Eligible hectares include any type of land except land used for growing permanent crops. Set-aside payments will be included, based on historical set-aside obligations, but can be activated only by an eligible hectare put into set-aside (excluding permanent pasture). Farmers receiving the new SFP will have the flexibility to produce any commodity on their land except fruit and vegetables, and table potatoes¹. In addition, they will be obliged to keep their land in good agricultural and environmental condition (see below). The single payment scheme can enter into force as of 2005 or at the latest 2007.

Some payments are not included, in particular the crop specific area payment for protein crops, 60% of the payment for starch potatoes, 42% of the payment for rice, the quality premium for durum wheat, and the area payment for nuts. Payments for commodities not included in the reform also remain commodity-specific. In addition, in order to limit the dereliction of agricultural land as well as take into consideration the concerns over land management of some Member States, the agreement allows part of the direct aids to farmers to remain coupled. The level at which these aids can be coupled is determined for each sector as follows (see also Table 2):

- Up to 25% of the current per hectare payments in the arable sector may remain linked to production. Alternatively, up to 40% of the supplementary durum wheat premium may continue to be tied to production.
- For the beef sector, Member States may retain up to 100% of the slaughter premium for calves and up to 100% of the present suckler cow premium and up to 40% of the slaughter premium, or up to 100% of the slaughter premium or alternatively up to 75% of the special male premium.
- A maximum of 50% of the sheep and goat premia including the supplementary premium in less favoured areas can remain linked to production.

1. If Member States opt for a regional implementation of the single payment scheme, *i.e.* provide a flat rate per hectare, equal to payment entitlements divided by eligible hectares, farmers can produce any commodity except permanent crops. In this context Member States have the flexibility to (1) allocate uniform payments entitlements within a region by taking into account all eligible hectares within the limits of a regional financial “envelope” to be defined; (2) vary payments between arable land and grassland as identified on 31 December 2002, without prejudice to the actual use of that land; (3) make different sectors contribute at different degrees to the redistributed amounts; (4) recalculate the regional per-unit value of entitlements; (5) redistribute funds between regions when the regional financial envelopes are defined; and (6) advance the integration of the milk premium into the SFP.

- Similarly, drying aid for cereals and direct payments in outermost regions and the Aegean Islands may remain tied to production.
- Dairy payments will be included in the SFP from 2006/07, once the dairy reform has been fully implemented. Member States may introduce the system earlier, from 2005, in the context of a regional implementation of the SFP.
- Member States may put aside up to a maximum of 10% of the total SFP to encourage specific sectors (within the SFP), which are important for the environment, quality production and marketing.

Payment entitlements may be transferred, with or without land, between farmers within the same Member State or regions, but it is an optional provision. In the case of transfers without land, the buyer has to possess eligible land to match the payment entitlements. Payments can thus be received only if there is land attached to them.

Member States are to create a national reserve via a linear percentage reduction of the reference amount, up to 3% of the envelope for the SFP. Entitlements that remain unused for three years will be transferred to national reserves. The national reserve is to be used for transition cases, young farmers, and exceptional circumstances.

Table 2. Minimum and maximum share of payments that can remain commodity-specific

Payments for:	Proportion of payment that must remain commodity-specific (“Maximum decoupling” option)	Proportion of payments that may remain commodity-specific (“Minimum decoupling” option)
Cereals and oilseeds	0	25
Durum wheat	0	40
Rice	42	42
Protein crops (supplementary p.)	100	100
Starch potatoes	60	60
Dried fodder	0	0
Nuts	100	100
Energy crops	100	100
Sheep	0	50
Beef		
Slaughter premium for calves	0	100
AND		
suckler cow premium	0	100
and		
slaughter premium for adults	0	40
Or		
Slaughter premium for adults	0	100
Or		
Special male premium	0	75
Milk	0	0
Drying aid, isolated regions aid	100	100

Source: CEC (2003b).

Compulsory cross-compliance

The full granting of the SFP and other direct payments will be linked to the respect of a certain number of statutory environmental, food safety, animal and plant health as well as animal welfare standards. This cross-compliance refers to three points already agreed to:

- A “priority list” of 18 statutory European standards has been established.
- Member States must ensure that there is no significant decrease in total permanent pasture area.
- In addition, beneficiaries of direct payments will be obliged to maintain all agricultural land in good agricultural and environmental condition or face reductions in payments.

In the case of non-respect of cross-compliance requirements, direct payments will be reduced in proportion to the risk or damage concerned. The reduction shall not exceed 5% and, in case of repeated non-compliance, 15%. But if non-compliance is intentional, the percentage reduction shall not in principle be less than 20% and may go as far as total exclusion from one or several aid schemes and apply for one or more calendar years. The Commission will outline indicators in order to facilitate the application of cross-compliance, while control will rely on existing mechanisms. Member states may retain 25% of the money collected through sanctioning non-compliance.

Strengthening Rural Development Regulation measures

EU money available for measures under the RDR will be significantly increased (see below) and the scope of instruments will be widened to promote environment, animal welfare, food quality and safety. Moreover, these norms will be more strictly enforced. EU support to agri-environmental measures will be increased to cover a maximum of 85% of the cost in areas covered by “Objective 1” (instead of 75%) and 60% (instead of 50%) in other areas.

The new measures described below will be introduced from 2004. It is for Member States and regions to decide if they wish to take up these measures within their rural development programmes.

New quality incentives for farmers

Incentive payments will be available for farmers who participate in recognised schemes designed to improve the quality of agricultural products and the production process used, and give assurances to consumers on these issues. Such support will be payable annually for a maximum 5-year period, and up to a maximum of EUR 3 000 per holding in a given year.

Support will be provided to producer groups for activities intended to inform consumers about and promote the products produced under quality schemes supported under the above measure. Public support will be permitted up to a maximum of 70% of eligible project costs.

New support to help farmers to meet standards

Member States may offer temporary and digressive support to help farmers to adapt to the introduction of demanding standards based on EU legislation, which are not yet included in national legislation, concerning the environment, public, animal and plant health, animal welfare and occupational safety. Aid will be payable on a flat-rate basis over a maximum period of 5 years, up to a maximum ceiling of EUR 10 000 per holding in a given year, and will be reduced over the implementation period.

A new "Farm Advisory System"

The establishment of a farm advisory system will be voluntary for Member States until 2006. From 2007 Member States must offer advisory systems to their farmers. Farmers' participation will be voluntary. In 2010, the Council shall decide whether the advisory system should become compulsory for farmers.

Support will be provided to farmers to help them with the costs of using farm advisory services. Farmers may benefit from public support of up to a maximum of 80% of the cost of such services, subject to a ceiling of EUR 1 500.

Covering animal welfare costs

Support will be available to farmers who enter into commitments for at least 5 years to improve the welfare of farm animals and which go beyond usual good animal husbandry practices. Support will be payable annually on the basis of the additional costs and income foregone arising from such commitments, with annual payment levels of a maximum EUR 500 per livestock unit.

Improved investment support for young farmers

EU investment aid for young farmers will be increased.

Reducing direct payments to boost rural development (modulation)

In order to finance the additional RDR measures, direct payments for farms with more than EUR 5 000 direct payment a year will be reduced by 3% in 2005, 4% in 2006 and 5% from 2007. This 5% reduction will result in additional RDR funds of EUR 1.2 billion a year. The mechanism of reducing CMO payments, known as "modulation", will operate as follows:

- The first EUR 5 000 of direct payments a year to any farm holding will be exempt.
- Outermost regions of the EU and the Aegean Islands will be exempt.
- As regards the distribution of the funds generated through modulation, one percentage point will remain in the Member State where the money is raised. The amounts corresponding to the remaining percentage points will be allocated among Member States according to criteria relating to agricultural area, agricultural employment and GDP per capita in purchasing power parity terms.
- Every Member State will receive at least 80% of its modulation funds in return.
- Member States whose rye production is very significant (*e.g.* Germany) can receive an additional 10% of the modulation funds raised in the Member State concerned in order to assist, within the framework of RDR measures, rye producing regions.
- Member States currently operating voluntary modulation will be able to increase the rate of modulation in order to ensure continuity of long-term programme commitments.
- Furthermore, of the 5% of modulation, the Council agreement foresees the possibility of putting aside one percentage point for crisis management measures. A report on this subject will be submitted by the European Commission by December 2004.

Ensuring financial discipline

A “financial discipline” mechanism will be applied in order to keep CAP spending in line with the budgetary ceilings laid down at the Brussels Summit of the European Council in October 2002. Based on a Commission proposal, the Council will fix the necessary reduction in direct payments each year if forecasts indicate that expenditures on market measures and direct payments (subheading 1a) will exceed budgetary ceilings in a given budget year, less a security margin of EUR 300 million.

3. Impact analysis: Approach and methods

This section briefly describes the tools and data used, in particular the Policy Evaluation Matrix (PEM) model, the AGLINK model and the Producer and the Consumer Support Estimate (PSE/CSE) database. It also defines the limits of both the tools and the analysis. While the combined crop-dairy PEM model is used to analyse the impact of the reform on land allocation, extensification and welfare, the AGLINK model focuses on dynamic market impacts for the period 2005-08.

The assumptions made to incorporate CAP changes and the simulations carried out are also presented. In some cases, changes in parameters explicitly represented in the models and calculations are clearly indicated in the agreement. In other cases, assumptions have to be made as to the impact of the proposed changes on the variables specifically represented. **Some aspects of the proposal cannot be taken into account in the quantitative analysis**, on the one hand because all Member countries have not decided yet on implementation options, and on the other hand because of the limits of the tools used (the UE is considered as an aggregate, regionalisation and cross-compliance are not included, there is no beef sector in PEM). To complement the quantitative analysis, a qualitative evaluation of some of these aspects is put forward in section 5. In addition, significant uncertainty remains as long as Members States have not indicated which options for decoupling they will adopt. Alternative scenario analysis is used to deal with such uncertainty (Box 2). Assumptions were made on the potential use of modulated funds.

The level of payments, quota and intervention prices for the commodities included in the different scenarios are set, as indicated in Table 1. Most payments are reduced to take account of modulation. The modulation rate is 5% from 2007, but the effective percentage reduction is lower as the first EUR 5 000 per farm is excluded. With a 5% rate, the EU Commission estimates that modulated funds will amount to EUR 1.2 billion per year.

Box 2. A scenario analysis

The reform of the CAP allows Member States to choose different options. These options, broadly speaking, determine the degree to which existing payments under the CAP are converted into a SFP. As OECD tools do not treat EU countries separately, assumptions are made regarding the aggregate impact of the different options. Two possible outcomes are considered in this report². These are:

- ◆ a “**maximum decoupling**” scenario, in which it is assumed that in all cases all countries will select the option that maximizes the amount of the SFP (as indicated in Column 1 of Table 2); and
- ◆ a “**minimum decoupling**” scenario, in which it is assumed that to the maximum extent possible, existing premia will be preserved. Minimum decoupling choices are indicated in Column 2 of Table 2.

In the reform, there are three minimum decoupling options for beef premia (Table 2). In order to limit the number of scenarios, a mixed option leading to the retention of 77% of the suckler cow premium, 0% of the special beef premium, 58% of the slaughter premium for adult animals and 100% of the slaughter premium for calves was chosen. These percentages were obtained by considering the relative importance of the different premia for beef in each EU member country and by assuming that countries would choose the option that allows retaining the highest percentage of coupling in the premium accounting for the larger share of their total beef premia.

These two scenarios therefore represent polar cases for the set of options available to member countries. While it is certain that neither of these outcomes will be seen in practice, they serve to define high and low boundaries on the results.

The regional option was not represented but such a scenario could give significantly different results because the allocation of payments between sectors at the EU level could be different from the actual situation. This option was not considered for two reasons. First, it did not seem to be important at the time the analysis was done. Secondly, because OECD tools treat the EU as an aggregate, it would not be possible to apply this option at the regional level, the level at which it would be implemented.

OECD tools and methods

Implementation of the crop and dairy PEM model analysis

The **PEM model** is a comparative static simulation model of the crop and dairy sectors comprising six country modules, **with the EU treated as one module**, and a “rest of the world” module. Although it does not represent EU member countries individually nor all agricultural sectors (in particular, the beef sector), this model does shed light on the aggregate impact of the CAP reform on land allocation due to its detailed representation of the land supply system. It has also a representation of factors of production that allows a detailed calculation of welfare impacts. The PEM analysis discussed in the next section emphasizes these two types of impacts: land and welfare.³ The main driving forces of the reform affect the land markets since both the current area payments for crops and the new SFP are paid per hectare. The main difference between them is the use to which the area receiving the payment can be put. This is represented in the PEM model by extending the set of land uses that are entitled to the payment.

Currently, the PEM model contains representations of demand and supply of wheat, coarse grains (maize, barley, and oats), oilseeds (colza and sunflower), rice and milk. This includes implicit production functions and market clearing for a set of production factors.⁴ While the PEM model does not contain other commodities explicitly, the representation of payments such as the SFP requires a more complete land allocation system to be used. The land supply system in the PEM includes some of the uses that are eligible to receive the SFP, such as land for pasture for beef cattle, other arable land, and other agricultural land. A

2. There are still uncertainties about when and how countries will implement the SFP.
3. The impact on welfare results primarily from variations in producer and consumer surplus and the dairy quota rent.
4. See OECD (2001) for a detailed description of the crop component of the PEM model. See AGR/CA/APM(2003)25 for more information on the crop and dairy PEM model.

stylized demand for land to be applied in these uses is also included in the model. Payments that accrue to these land types will influence land allocation decisions across all possible uses, including most importantly those uses explicitly represented in the PEM.

Current main CAP program payments to grains and oilseeds are represented in the PEM model as payments accruing to the land used for the specific commodities to which they are directed. The “maximum decoupling” scenario is simulated with the PEM model. The details of its implementation are described in Box 3. Generally, the SFP is not associated with the planting of a specific crop and so will accrue to agricultural land more generally, including that used for pasture or other arable crops⁵. The distribution of this payment is based to a considerable extent on the level of payments currently received by producers. For this reason, the SFP is distributed in the PEM model proportionate to current direct payments to crops. In the same manner, SFP payments are assumed to be allocated to land used for livestock according to the levels of payments currently received by users of this type of land. Under CAP reform, livestock premia are (to some extent) replaced by the SFP. This is represented as a 3.1% reduction in demand for land for pasture derived from response to these payments in the AGLINK model. The option of a regional implementation of the payment is not analysed in this study. As the payment per hectare would be the same across all land types within each region, the allocation effect would be quite different.

The results of the central PEM scenario and the sensitivity analysis on certain parameters are described in the next section. The base period is 2002 and the simulations describe the estimated changes in 2002 area planted, production, net exports, producer and world prices, and transfers that would have occurred if the changes in payments and intervention prices to be in place by 2008 had been implemented in 2002. The effects of crop and dairy changes on commodities that are not included in the model and other changes outside the scope of the model are not taken into account in this analysis, even though they could have an influence on the results.

**Box 3. The implementation of the “maximum decoupling” scenario
in the analysis using the PEM model**

- ◆ Reductions in cereal producer prices to reflect the impact of the cut in intervention price monthly increments.
- ◆ The 50% reduction in the intervention price for rice is expected to eliminate market price support for rice, *i.e.* the producer price is set at the world price level.
- ◆ The 25% reduction in the intervention price for butter and the 15% reduction in the intervention price for skimmed milk powder are expected to result in a 17.7% reduction in the producer price for milk (Commission’s estimate).
- ◆ Reductions in incentive prices due to the risk effects associated with the above cuts in intervention prices of cereals, rice and dairy products (The value of risk premiums and the methodology used to derive them are presented in Annex 2).
- ◆ Increase in quota level by 1.6%, according to Agenda 2000 timetable (1.5%) and specific quota increase for Greece and Portugal (0.1%).
- ◆ Consequently, the milk quota remains binding.
- ◆ Maximum change from area payments to SFP for arable crops and rice.
- ◆ New area payment for rice.
- ◆ New SFP for milk and SFP with maximum decoupling for beef.
- ◆ Reduction of all payments to reflect modulation in 2008 as in the PSE analysis (see Box 5).
- ◆ Sensitivity analysis on the main elasticities.

5. Excluding land for table potatoes, fruits, and vegetables. We do not count for the possibility of cultivating vegetables and potatoes in the cases where regionalisation is chosen, and which could lead to different results.

Implementation of the AGLINK analysis

AGLINK is a global model used to assess the evolution of regional and international commodity markets. Every year a baseline for market developments is established, relative to which policy scenarios can be compared. It allows the estimation of the mid-term impact of the reform on market developments for a number of commodities. The most recent simulation period is 2003-08 (OECD, 2003a).

Most OECD countries, including the **EU as one aggregate bloc**, and some large non-member economies are endogenous to the model. For cereals, oilseeds and rice, AGLINK contains equations for harvested area, yields, production, consumption, feed use, net trade, domestic and world market prices as well as administered prices. Area payments in the EU are modelled as an equivalent farm return per hectare in the aggregate area equation, but are assumed to have no direct impact on crop yields. Other commodity markets, including many livestock products such as beef and veal, pigmeat and poultrymeat, are also represented in AGLINK. Headage payments in the EU are modelled as an equivalent farm return per head in the production equations, depending on the degree to which ceilings limiting the number of payments are likely to become binding constraints. In the EU dairy module, production of milk is exogenous (equal to the quota). The module contains equations for production, consumption, trade and domestic and world prices of dairy products, including butter and SMP. Intervention prices are explicitly included.

AGLINK was used to simulate the impact on cereal, rice, oilseed, beef, and dairy markets of the policy changes applying to these commodities. Cross-commodity effects are taken into account. **Changes to some crop policies could not be represented as the crops in question (for example, dry fodder or nuts) are not included in the model.** Expected changes in rye production following the abolition of intervention for rye are reflected as exogenous shifts in the production of "other cereals", as well as an additional impact on the effective intervention price relating to aggregated coarse grains, as discussed in Annex 1. The expected impact of changes in payments on sheepmeat production is exogenously taken into account. Milk quotas are assumed to remain binding and continue to determine production levels.

The representation of EU policy measures in AGLINK is given in Annex 1. Policy changes are incorporated as described in Box 4. The scenarios estimate what will happen to cereal, rice, oilseeds, beef, sheep and dairy markets during the 2003-08 period given CAP changes decided in June 2003 compared to what would have happened without changes. Changes agreed under Agenda 2000 to be implemented after 2002 (in the dairy sector) are incorporated in the baseline.

Changes in intervention prices, payments and quotas from 2004 are shown in Table 1. Changes in risk premiums reflecting the risk effect of changes in intervention prices for wheat, coarse grains and rice on producer incentive prices⁶ are included. Changes in the risk premium for milk are not included as production is determined by the level of the quota, which remains binding. In any case, they are found to be negligible because of the high level of support. The methodology to derive such premiums and some results of this risk analysis are included in Annex 2.

In both scenarios, the SFP is introduced in 2005.⁷ It includes the new milk payment from 2005 in the maximum decoupling scenario and from 2007 in the minimum decoupling scenario.

-
6. Producer incentive prices are expected producer prices plus risk premiums calculated according to changes in mean and variance of market prices.
 7. In fact, countries are allowed to delay the implementation of the SFP until 2007, but this option is not represented here.

**Box 4. Assumptions and methodology for AGLINK analysis:
implementation of CAP changes in the EU aggregate module**

- ◆ Intervention prices for cereals are reduced by EUR 1.22/tonne to reflect the 50% cut in monthly increments. Effective intervention prices for coarse grains are reduced by a further EUR 1.15/tonne to reflect the abolition of intervention for rye.
- ◆ Risk premiums are added in the generation in effective returns per hectare as a price supplement to market prices of wheat, coarse grains and rice.
- ◆ It is assumed that the production impact of payments based on area planted (area payments) and payments based on historical entitlements (SFP) is a portion of the corresponding impact of price support. In the central scenarios, these production ratios are assumed to be the same as those estimated in Dewbre *et al.* (2001). A ratio of 0.14 is used for area payments and a ratio of 0.06 is used for the SFP in the area equation. These ratios also enter in the rice area allocation. Furthermore, the production ratio of 0.06 is also assumed to reflect the effect of the SFP on beef production. A sensitivity analysis is carried out on these ratios.

Scenario 1. Maximum decoupling in all countries for all commodities in 2005

- ◆ Area and headage payments are set to zero in area equations (except for rice where 42% of the payment remains commodity-specific) and the beef production equation of AGLINK.
- ◆ Introduction, in the same equations, of a SFP amounting to the total of previous crop and livestock payments, and the new milk payment (see table below), using the above mentioned production ratios.

	2003	2004	2005	2006	2007	2008
Single farm payment before modulation in billion EUR						
Maximum decoupling	0	0	26.9	28.3	28.3	28.4
Minimum decoupling	0	0	16.3	16.3	20.6	20.6

- ◆ Reduction in most payments to take account of modulation, using effective modulation rates by commodity estimated by the EU Commission, based on the share of output value affected by modulation in the FADN database.

Scenario 2. Minimum decoupling in all countries for all commodities in 2005 (milk in 2007)

- ◆ Area and headage payments for commodities remain coupled to the maximum extent allowed as indicated in the second column of Table 2. For beef, the mixed scenario indicated in Box 2 is implemented. The milk payment is set to zero in 2007 as it is assumed to enter the SFP at a later stage than in the maximum decoupling scenario.
- ◆ Introduction, in the same equations, of a SFP equivalent to the share of crop, livestock and dairy payments that is decoupled (see above Table) using the same production ratios given above.
- ◆ Reduction in most payments to take account of modulation.

Payments enter in the crop area and beef production equations. For area payments and the SFP, production ratios are estimated using the PEM crop model (Box 4). They compare the relative production impact of area payments and payments based on historical entitlement with the impact of equivalent amounts of market price support. The methodology for deriving such production ratios is described in Dewbre *et al.* (2001). The ratios are applied to the different categories of payments in the relevant AGLINK crop and livestock equations. As PEM does not contain a beef sector, the same ratio is used for the SFP in both the crop area and beef production equations (Box 4).

The principal effects of the trend towards less coupled forms of support to EU farmers can be described by looking at Figure 1, which represents the area allocation decision of a producer as a stepwise decision-making problem. After a first decision has been taken on the total area to be devoted to cereals and oilseeds (including set-aside), fodder crops and pasture (as opposed to other activities not taken into account in the model – see the top level of Figure 1), this total is then distributed between cereals and oilseeds (including set-aside) on the one hand, and fodder and pasture area on the other (second level in the graph). The allocation of land between cereals and oilseeds is then made in a third step (which takes set-

aside into account, depending on both the compulsory set-aside rate and crop returns), and is thereafter broken down into individual crop areas (lowest level in Figure 1).

Before 1992, support was predominantly delivered via intervention prices that varied by crop. The different intervention prices for cereals determined which crop to plant. As can be seen at the bottom of Figure 1, such price support created incentives for the area decision at all levels, including the individual crop level. For example, higher support price for wheat would increase the incentive to produce wheat compared to other grains. At the same time, compared to oilseeds, incentives were increased to produce cereals, as average cereal profitability increased, and so on, for higher decision levels.⁸

The area payments that were introduced to compensate for reductions in intervention prices in 1992 did not favour a specific cereal crop compared to another, but oilseed producers received a higher payment per hectare than grain producers. These payments were important in determining whether to plant cereals or oilseeds (or to set-aside land) (Figure 1), but were not relevant for the allocation of land across individual cereals or oilseeds.

The Berlin Agreement on the Agenda 2000 reform equalised these payments between oilseeds, cereals and set-aside. Therefore, payments no longer influenced the choice between these commodity groups. Of course, as shown in Figure 1, they still had an impact on the total area devoted to these uses. In other words, farmers still had an incentive to keep land in this general category of use, if not in a specific crop.

The new SFP includes fodder crops and pasture, as well as some other crops and idling, as eligible activities. The direct impact of these payments therefore relates to the decision on the total of these land uses (as opposed to the small share of non-eligible uses such as fruits, vegetables, and particularly non-agricultural uses).

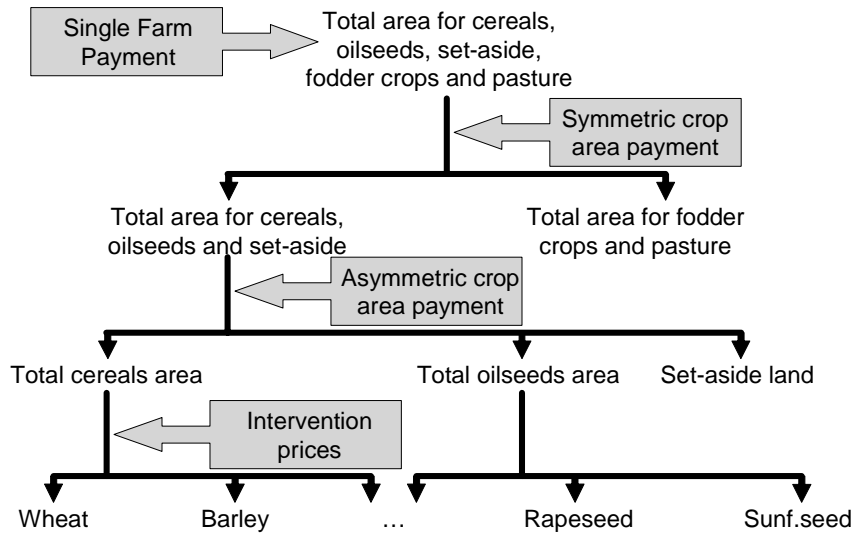
The impact of the various support measures is represented in AGLINK in a three-step area allocation system (corresponding to the three lower layers in Figure 1), with the first decision relating to the choice between the total area for cereals and oilseeds on the one hand, and the total area for fodder crops and pastures on the other hand, the second to the split between cereals and oilseeds, and the third where areas of individual crops are determined.⁹ The policy measures mentioned above drive decisions at the different levels. The SFP, by contrast, affects only the first stage of the diagram as subsequent allocation decisions depend only on relative returns. Given that the total area for cereals, oilseeds, fodder crops and pasture is exogenous in the model, the impact of the SFP is reflected in the equation for the total area for cereals and oilseeds, using a reduced-form, or impact coefficient for the SFP, as compared to the area payments. While idling is not explicitly included in the model, a reduction in the total area for cereals and oilseeds can be partly interpreted as an increase in fallow land.

The results of the scenarios carried out using AGLINK are analysed in the next section.

8. At the same time, of course, the price support had a stimulating impact on crop yields. Here we focus on the area allocation and ignore the relationship to yields.

9. AGLINK takes into account crop set-aside by reducing the different crop areas by the total land set-aside rate. This depends on both the compulsory set-aside rate and voluntary set-aside which is determined by the average returns obtained from cereal and oilseed production. Thus, land set-aside is effectively deducted from the total cereal and oilseed land area before the total cereal and oilseed area is allocated between the different crops, as indicated in Figure 1.

Figure 1. Area allocation system in AGLINK and points of impact of various support measures to EU crop farmers



Note: See main text for further information.
 Source: AGLINK Modelling System.

Implementation of the PSE analysis

The **Total Support Estimate (TSE)** is an indicator of support to the agricultural sector and the **Producer Support Estimate (PSE)** is an indicator of support to agricultural producers, arising from agricultural policy. The PSE includes transfers from market price support (MPS) and transfers from budgetary payments, classified according to implementation criteria. Most recent estimates of PSEs and TSEs from 1986 to 2002 are published and analysed in OECD (2003b).

The TSE/PSE analysis presented here reports the estimated impact of changes in MPS for some commodities as indicated in Box 5, and in the level and type of payments on the level and composition of support in the EU, as measured by the PSE and the TSE. The analysis describes what would have happened to PSE and TSE in the EU if CAP changes to be in place in 2008 had been applied in 2002, the most recent year for which TSE/PSE estimates are available, all other things equal. Specific changes implemented are described in Box 5.

Box 5. Changes made to TSE and PSE in the EU compared to the 2002 base year data**Market Price Support (MPS) calculations**

- ◆ %changes in production, consumption, domestic and world prices from AGLINK (Tables 5 to 7) in 2008, compared to the baseline, are used to estimate the impact of CAP changes on market price support for wheat, coarse grains and beef. For milk, production remains bound by the quota and increases by the same percentage (1.6%). The reduction in producer price of 17.7% is the EU Commission's estimate. Increases in the world price (1.5%) and consumption (5.6%) are derived from PEM simulations.¹⁰
- ◆ MPS for rice is equal to zero, as the reduction in intervention price brings domestic prices back to the world price level.
- ◆ MPS for all other commodities is assumed to be unchanged.

Payment levels as applied in 2008 (see Table 1)

- ◆ No change in national expenditures.
- ◆ No change in EU payments unless specified in the 2003 reform and Agenda 2000 for milk.
- ◆ Supplementary payment to durum wheat in traditional areas reduced from EUR 344.5 to 285/tonne.
- ◆ Supplementary payment to durum wheat in other areas set to zero.
- ◆ Quality premium for durum wheat assumed to apply to 80% of 2002 area (set to EUR 128 million = EUR 40/ha*4 million ha* 0.8).
- ◆ Rice payments: global payment = 2002 payment increased by 96% (from EUR 52 to 102/tonne)
specific rice payment = 2002 payment increased by 44% (from EUR 52 to 75 /tonne).
- ◆ Protein crop supplement becomes based on area and increases from EUR 72 to 77.8 million (= EUR 55.57/ha * 1.4 million ha).
- ◆ Dried fodder: payment for producers of EUR 152 million (= EUR 33 /tonne * 4.86 million tonnes).
payment to processors of EUR 152 million.
- ◆ Nuts: current payment for marketing/promotion (EUR 94 million) replaced by a payment per ha of EUR 193.2 million, including EU and national payment (= EUR (120.75+120.75) /ha * 0.8 million ha).
- ◆ Energy crops: maximum payment based on area of EUR 67.5 million (= EUR 45 /ha * 1.5 million ha)¹¹.
- ◆ Beef payments: increased by the % change in animal numbers eligible to receive the suckler cow premium (1.75%). The payment for the special beef premium is unchanged because the decrease in the eligible number of animals in Austria is assumed to be not binding.
- ◆ Milk payment: set to EUR 4 278 million (EUR 35.5/tonne of quota*120.505 million tonnes of milk quota in 2008).

Reclassification and modulation of payments

- ◆ Payments to producers for cereals, oilseeds, protein crops, grain legumes, rice, flax, hemp, linseed, starch potatoes, durum wheat supplement, dried fodder, beef, sheep (but not milk, fruits and vegetables, olive oil, wine, tobacco, less favoured area, etc.) to be reclassified in the PSE as "payments based on historical entitlements" (EUR 27.9 billion with maximum decoupling; EUR 20.5 billion with minimum decoupling after modulation).
- ◆ Most payments reduced to account for modulation. For a 5% modulation rate, the annual amount of modulated funds is estimated to be EUR 1.2 billion with both maximum decoupling and minimum decoupling (EU Commissions' estimate based on FADN data). In the PSE, payments to be modulated are all reduced by the same percentage, which is necessary to obtain this amount.

(cont.)

10. Impacts on the MPS for milk, compared to the 2002 situation, could not be derived from AGLINK scenarios, which only reflect policy changes decided in 2003.

11. The EU Commission estimates that land used for energy crops will remain well below 0.5 million ha.

- ◆ The modulated amount made available to RDR measures is allocated to current measures (agri-environment, less-favoured areas, afforestation of agricultural land and early retirement) and to new measures. It was assumed that new measures would be allocated two thirds of the available amount, in equal proportion for each measure and that current measures would be allocated one third, shared in proportion to spending on each measure in 2002 as reported in the PSE.
- ◆ New measures comprise:
 - producer aid per holding to meet the requirements of quality schemes, to be included in the PSE as payments based on (a set of) input constraints;
 - support for producer groups for the promotion of quality products, to be included in the General Services Support Estimate (GSSE) as marketing-promotion;
 - producer payment to comply with required standards, to be included in the PSE as payments based on (a set of) input constraints; and
 - support to farm audits, to be included in the PSE as payments based on input use (on-farm services).
 - support to farmers who commit to improve animal welfare to be included in the PSE as payments based on (a set of) input constraints.

Results from the analysis reported in the next section depend on the structure and the coverage of the models, on the assumptions made and on the parameters introduced in the modelling tools. They also depend on the situation in the base year, which differs in the different analyses undertaken (it is 2002 in both the PEM and PSE analyses, but covers the period 2004-08 in the AGLINK analysis). In addition, certain aspects of the proposal cannot be taken into account, on the one hand because the EU is represented as an aggregate, the regional option was not retained, cross-compliance is not taken into account, and some commodities considered are not included in the models (beef in particular is not included in the PEM model) and on the other hand because a majority of countries have not yet decided on the modalities of implementation, particularly regarding decoupling. The different options presented in Box 2 allow this uncertainty to be taken into account. They represent both extremes among all the options available to Member States and define upper and lower bounds for the results. Therefore, the results do not necessarily indicate what will happen when the CAP changes are implemented.

4. Estimated effects of the CAP reform on production, input use, welfare, markets and support level and composition

The impact of changes in administered prices and payments (level and delivery conditions) as implemented in the EU module (Box 3) on land use, extensification and transfers estimated using the PEM crop and dairy model are reported first. The impact of CAP, as implemented in the EU aggregate module of AGLINK (Box 4), on market developments compared to the baseline are then discussed. Changes in risk faced by producers and in the degree of decoupling of payments are taken into account in both the PEM and AGLINK analyses. Finally, the resulting impact on production, consumption, producer and domestic prices is used to estimate changes in the MPS component of the EU PSE. Changes in payment level and category are also reflected in the EU PSE and TSE. In analysing the results, it should be kept in mind that the two scenarios presented do not reflect all options that Member States might consider regarding the extent to which some payments remain commodity-specific. They might also opt for a regional implementation of the SFP, which has not been considered here but would have different implications. It should also be noted that estimated results, particularly of changes as large as those that have been decided for rice, need to be taken with care as models such as PEM and AGLINK are generally designed to simulate smaller changes.

Estimated impact of the reform on land allocation, extensification and welfare

Impact on area allocation and extensification

Table 3 summarizes the impact of the “maximum decoupling” scenario on land allocation, yields and extensification¹². Sensitivity analysis across 5 000 simulations with different stochastic but plausible values for the main parameters of the model were carried out. The results in Table 3 are presented in terms of the average change and its standard deviation across all the stochastic simulations. As explained in Box 3, the scenario assumes the amount of the SFP is maximised (maximum decoupling). Land used for PEM crops (cereals, rice and oilseeds) is estimated to decrease by between 2% and 3% due to movements of land to other uses that, as a result of the reform, are also entitled to the payment. The model estimates a moderate increase in yields (around 2%) due to incentives to use inputs other than land and a slight increase in prices in view of the greater competition and higher cost for this input. The net estimated effect is a rather small reduction in crop production, ranging between -0.3% and -1.1%. However, the standard deviations across simulations are nearly as large as the average production change in absolute value and, therefore, these production decreases are not very significant. When all sectors are taken into account, the decrease in production could, perhaps, be somewhat more pronounced.

The results for rice should be interpreted carefully because the change from price support to area and the SFP is very large. Support no longer serves as a direct incentive to rice production because the reduction in intervention price is assumed to result in zero price support. While 42% of the new rice payment remains attached to rice land, the remainder is integrated in the SFP. These movements are estimated to result in a 44% reduction in rice production. The sensitivity analysis shows a lot of uncertainty about the magnitude of this change, with some simulations with plausible parameters resulting in production reductions of only 2%.

The exclusion of the beef production sector in the PEM model is an important limitation of the analysis given the importance of joint production in the beef and dairy sectors in the EU. The results do not therefore necessarily demonstrate what could happen in reality. In particular, the model may not capture some reallocation of resources, particularly land, between these two related sectors. According to modelling results, pasture land for dairy cows increases by 16% due to significant extensification. The new payment generates incentives to use land rather than other inputs in milk production. This shows up in a reduction of the density of cows per hectare of 14%. After reform, PEM simulations show that the milk quota continues to be binding, so that the increase in milk production is equal to the increase in the quota. Extensification also occurs in the beef sector, even if the current model structure captures it only in a very stylized way.

12. Impact on idled land could not be isolated as the PEM model does not identify this category of land use separately.

**Table 3. PEM analysis of the “maximum decoupling” scenario:
the impact on area allocation, yield and extensification**

	Average	Standard Deviation
Land for Crops and Dairy		
Change in area (million ha)	1.96	0.37
%change in area	3.2%	0.6%
Wheat		
Change in area (million ha)	-0.40	0.14
%change in area	-2.2%	0.8%
%change in yield	1.9%	0.8%
%change in production	-0.3%	0.4%
Coarse Grains		
Change in area (million ha)	-0.48	0.16
%change in area	-2.5%	0.8%
%change in yield	1.8%	0.8%
%change in production	-0.7%	0.7%
Oilseeds		
Change in area (million ha)	-0.14	0.04
%change in area	-2.8%	0.9%
%change in yield	1.8%	0.7%
%change in production	-1.1%	0.6%
Rice		
%change in production	-44.6%	9.8%
Other Arable		
Change in area (million ha)	-0.06	0.03
%change in area	-0.7%	0.3%
Dairy animals/hectare		
Change in area (million ha)	3.0	0.3
%change in area	16.2%	1.5%
change in stocking density (cow per ha)	-0.06	0.01
%change in stocking density	-14%	1%

Note: The area for dairy uses increases while the area used for crops and beef production decreases. The beef sector is not represented in the PEM model, except through a reduced form demand for land.

Methodology: 5 000 complete sets of factor substitution and supply elasticities were drawn for every crop and every country in the model, according to a random procedure. The PEM model is run to estimate the effects of the “maximum decoupling” scenario of the PEM analysis.

Source: PEM sensitivity analysis (5 000 simulations).

Impact on domestic welfare

Table 4 presents the results of the PEM sensitivity analysis on domestic welfare for the “maximum decoupling” scenario. The analysis assumes that land is owned by farm households. The results have to be interpreted with caution because of two main factors. First, some agricultural sectors are missing, therefore

net welfare across all agents in the sector may differ from the results of the partial analysis given here¹³. This caveat is especially true for dairy producers, whose welfare is very much interlinked with beef producers' welfare. Second, the assumption about how dairy intervention prices are transmitted to farmers is only an estimation.

The general picture shows a significant welfare transfer from taxpayers and farmers to consumers. The amount of this welfare transfer is around EUR 6 billion (which represents about 2.5% of European farm receipts) and it is dominated by changes in the dairy sector: taxpayers fund the new milk payment while consumers benefit from lower dairy prices. Dairy farmers are worse off due to an assumed under-compensation of the estimated milk price reduction with the new payment.¹⁴

**Table 4. PEM analysis of the "maximum decoupling" scenario:
the welfare impacts in the EU crops and dairy sectors**

	Average	Standard Deviation
	~ Change, million EUR ~	
Farm Households	-2 281	191
..of which farm capital	-42	48
..of which dairy land	2 180	68
..of which crops land	170	182
..of which quota rents	-4 589	120
Consumers	6 191	44
..of which dairy	6 117	4
..of which crops	73	41
Taxpayers	-2 960	6
Input Suppliers	-175	158
Total	774	312

Methodology: See note in Table 3.

Source: PEM sensitivity analysis (5 000 simulations).

Crop farmers are better off primarily because modulation for cereals and oilseeds payments reduces crop farmers' welfare by much less than the amount actually deducted. This is due to higher output prices and higher demand for agricultural land from other sectors that increase rents from land. Other crop farmers should also benefit from better transfer efficiency, moving to more decoupled payments.

Consumers of crops other than rice experience very small losses due to slightly higher prices, but rice consumers gain due to the large drop in the price of rice. There is an estimated net welfare gain for consumers of crops.

-
13. The fact that the beef sector is not included in the model does not allow comparisons of welfare impacts between minimum and maximum decoupling because in the case of minimum decoupling, the welfare effects in the beef sector cannot be captured when a part of the beef premia is maintained.
14. This under compensation in reality may not be as large as estimated in the model if part of the quota rents were not captured by dairy farmers.

In so far as taxpayers are concerned, the decrease in their welfare is the result of several factors. They benefit from a reduction in dairy export subsidies (exports account for less than 10% of European production), but they finance the cost of the new dairy payment, which is ten times higher. Given that the model does not take rural development measures, which will be funded by modulation, into account, taxpayers benefit from the reduction in expenditure from modulation in crops and dairy in the simulation. In reality, however, modulation has no effect on the taxpayer (in so far as rural development is concerned).

Impact of the reform on market developments over the period 2003-08

This section shows the likely impact of the 2003 EU CAP reform on the EU and world markets for cereals, rice, oilseeds, beef, pigmeat, poultrymeat and dairy products compared to the baseline published in OECD (2003a). As discussed above, this part of the analysis is based on the OECD's AGLINK model and spans the projection period 2003 to 2008. The effects for the years 2004 to 2008, when the new provisions will be in place, are presented. The results of the scenario that assumes maximum decoupling decisions possible are discussed first. Another scenario assuming minimum allowable decoupling decisions, as well as a sensitivity analysis on the degrees of decoupling of the SFP as compared to that of the Agenda 2000 area payments, are discussed subsequently.

In summary, the scenario analysis shows that the main impact of the reform on markets occur for rice because of the significant changes in administered prices and payments. For other commodities, the main changes are driven by the conversion of payments into the SFP, which reduces returns from commodity production. As a result, land use for most crops and beef cow inventories start declining. Changes in the crop sector are found to be moderate. Wheat area and production are reduced compared to the baseline during the whole simulation period, but coarse grain production reacts to an increase in price due to higher feed use at the end of the period. During the whole period, the relative profitability of oilseed production is enhanced because of the lower annual average intervention price for cereals. Beef production decreases as returns from payments are lower with decoupling. This results in higher prices, which in turn reduces consumption. Although milk production remains bound by the quota, further cuts in the intervention price for butter, compared to Agenda 2000, result in lower domestic prices for milk and most dairy products, leading to lower production of skimmed and whole milk powder. Significant drops in EU dairy product exports cause world prices to increase. These movements are explained in greater detail below.

Market effects for crop markets with maximum decoupling decisions

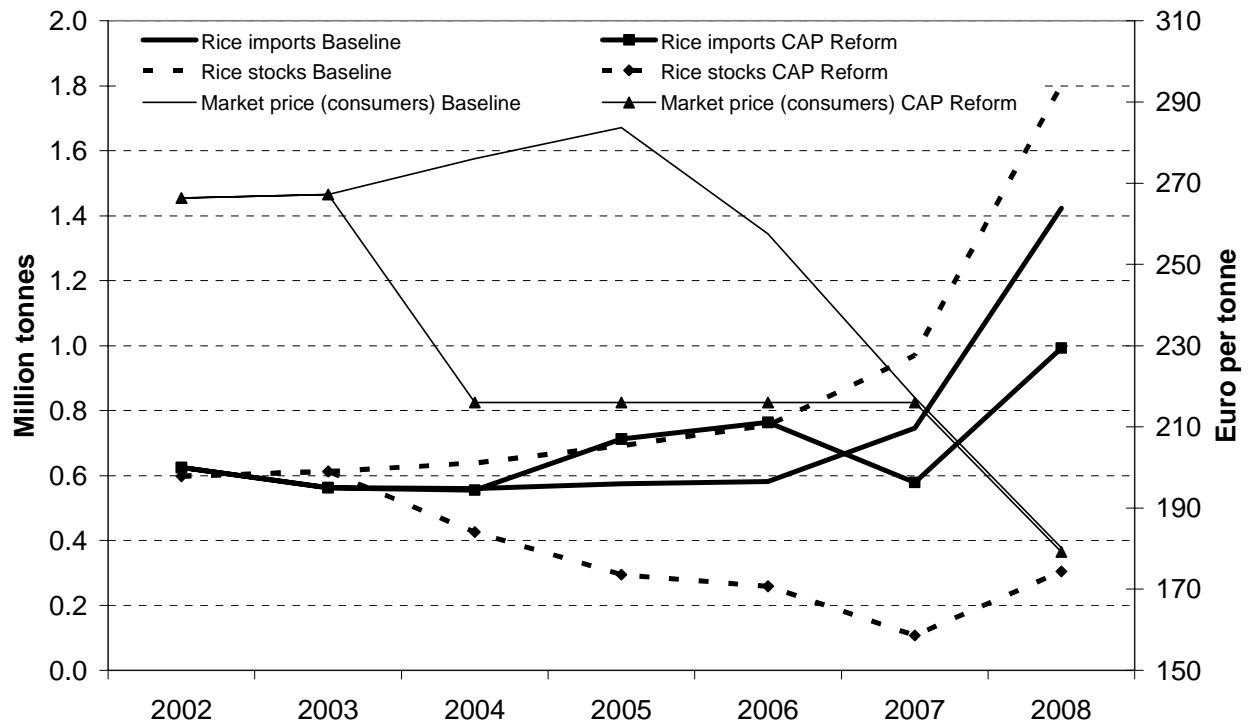
Crop market effects of the CAP reform are presented in Table 5. The most significant change in terms of market impact is the reduction in the rice intervention price¹⁵, which is to be cut by half from 2004. Despite the compensation payment, 58% of which becomes part of the SFP from 2005, rice area is found to decrease by around 9% compared to the baseline.¹⁶ With some decline in rice yields, the impact on rice

15. It should be noted that these results strongly depend on the baseline used. Here, OECD Agricultural Outlook 2003-2008 projections are used (OECD, 2003a), which assume the continuation of Agenda 2000 policies plus the implementation of the Everything-But-Arms Agreement. These projections, however, indicate that this combination of policies is unsustainable as, by 2008, most of the rice consumption in the EU would be imported, while most of the domestic production would go to intervention stocks. Ending stocks in 2008 would exceed EU rice production in that same year, with an exploding trend in the absence of a policy change (see OECD, 2003a for a more detailed explanation of the baseline). Therefore, a comparison of the CAP reform scenario with the baseline has to be interpreted with care.

16. Note that in AGLINK, the use of land for rice production is a function of returns to rice only, without direct links to other land uses. While the reduction in land used for rice can be expected to benefit maize production to some degree, this is unlikely to have a significant impact on overall coarse grains production.

production is estimated to be about -11%.¹⁷ Consumption – and hence stocks – are simulated to respond promptly to the price cut (Figure 2). The effect on domestic consumption becomes smaller at the end of the period when, as a result of the Everything-But-Arms Agreement (EBA), domestic consumer prices were already projected to fall in the baseline. The reduction in the support price prevents intervention stocks from exploding. Rice imports to the EU are reduced vis-à-vis the baseline by more than 30% at the end of the projection period because EU consumers buy more domestic rice (and thereby reduce EU stock levels) as a result of lower domestic prices.

Figure 2. Development in EU rice imports, stocks and market prices from 2002 to 2008: Agenda 2000 and CAP reform



Source: AGLINK simulation results.

The effective reduction in cereal intervention prices (due to the cut in monthly increments, as well as the abolition of rye intervention) results in corresponding declines in domestic market prices for wheat and coarse grains in the initial years of the reform implementation. Average coarse grain prices are reduced by almost 2% in 2004. With crop production adjusting and responding to changes in the payment regime, medium-term prices recover during the rest of the period. This effect is less pronounced for wheat than for coarse grains as intervention stocks of the latter are reduced significantly relative to the high levels in the baseline, whereas public stocks of wheat are unlikely to be significant even with unchanged Agenda 2000 intervention prices. As a result, wheat prices increase only slightly above the baseline level, while coarse

17. PEM simulations also result in a reduction in rice production. However, in the PEM land allocation system, the maintenance of payments linked to rice land and the introduction of the SFP, which benefits all types of land uses generates an increase in the land used for rice of a few thousand hectares (to the detriment of land used for other crops). As explained above, this effect is limited in AGLINK because there is no direct substitution allowed between land for rice and land for other uses. In any case, whatever the assumption about land allocation and substitution, the direction of the impacts on production is consistent between the two models.

grain prices increase by up to 0.8% relative to the baseline. Both changes become smaller towards the end of the simulation period, with 2008 simulated wheat prices actually slightly below baseline levels: as the price effect of lower production becomes smaller, it is more than offset by reduced subsidised exports due to the lower average intervention price.

Total area for cereals and oilseeds is reduced slightly as opposed to a slight increase in fallow land, pasture and fodder crops as both area payments and headage payments are converted into the SFP, with a lower incentive for production. The impact on individual crops differs substantially, with wheat area reduced more significantly in favour of oilseed area. The effective reduction of cereal intervention prices makes oilseed production more profitable relative to these grains. This effect becomes small towards the end of the simulation period when markets have adjusted to the initial change. The reduction of durum wheat specific payments is likely to have a further decreasing impact on cereal area; durum wheat is not explicitly considered in this analysis, however.

EU exports of coarse grains remain bound by WTO limits on subsidised exports, and therefore, with unsubsidised exports of malting barley assumed to be unaffected, do not change in response to policy reform. Reductions in coarse grains production, but increases in feed use allow significant reductions in coarse grain stocks (by 41% of their baseline level by the end of the simulation period). As intervention for rye has been abolished, the composition of both exports and intervention stocks is likely to change in favour of feed barley.

Table 5. Impact of the CAP reform on EU markets for cereals and oilseeds, assuming maximum decoupling, 2004-08 (% change from the baseline)

		2004	2005	2006	2007	2008
Wheat	Area harvested	0.0	-1.3	-1.0	-0.9	-0.5
	Yield	-0.2	0.1	0.0	0.0	0.0
	Production	-0.2	-1.2	-1.0	-0.9	-0.5
	Total consumption	-0.4	-0.3	0.0	0.2	0.3
	Exports	1.1	-5.8	-6.0	-6.7	-4.4
	Ending stocks	0.0	0.0	0.0	0.0	0.0
	Domestic price	-0.9	0.5	0.2	0.0	-0.1
Coarse grains	Area harvested	0.0	-1.7	-1.2	-0.5	0.0
	Yield	-0.2	0.0	0.1	0.1	0.1
	Production	-0.2	-1.7	-1.1	-0.4	0.1
	Total consumption	0.3	0.0	-0.4	-0.4	-0.1
	Exports	0.0	0.0	0.0	0.0	0.0
	Ending stocks	-6.1	-30.8	-42.8	-44.7	-41.0
	Domestic price	-1.9	-0.1	0.7	0.8	0.5
Rice	Area harvested	-2.9	-9.0	-9.3	-9.5	-9.5
	Yield	-2.4	-2.4	-2.4	-2.4	-2.4
	Production	-5.2	-11.2	-11.5	-11.7	-11.8
	Total consumption	6.5	7.1	4.6	0.1	0.2
	Imports	-1.0	23.9	31.4	-22.4	-30.2
	Ending stocks	-33.4	-57.4	-65.7	-88.9	-83.1
	Domestic price (consumers)	-21.8	-23.9	-16.1	-0.5	-0.6
Oilseeds	Area harvested	0.0	-0.3	0.2	0.6	-0.4
	Yield	0.0	0.0	0.0	0.0	0.0
	Production	0.0	-0.3	0.2	0.7	-0.4
	Total consumption	0.0	0.0	-0.1	0.0	0.0
	Imports	-0.1	0.2	-0.3	-0.4	0.4
	Ending stocks	-0.1	0.0	-0.1	0.1	0.0
	Domestic price	0.0	0.0	0.2	0.2	0.1

Source: AGLINK simulation results.

Neither intervention stocks nor WTO limits on subsidised exports play a major role in the baseline wheat projections. The combination of Agenda 2000 support policies, world market prices and exchange rates allow for significant quantities of wheat to be exported without subsidies in the baseline. Therefore, any increase in wheat used for feed, as well as the reduction in production quantities, result in reduced wheat exports to third countries. Total wheat exports are found to decline by 4% on average over the period 2004-08.¹⁸

Oilseed production is affected directly by the shift in area payments to the SFP in this analysis, but also indirectly through substitution in land allocation due to changes in returns and demand for oilseed products, as well as to the reduction in price support for cereals. On average over the 2004-08 period, oilseed market quantities are hardly changed, whereas prices would be somewhat higher than foreseen in the baseline. As larger oilseed supplies are only partly offset by higher crush quantities following the increased feed demand for oilseed meals, oilseed imports on average are slightly reduced. At the same time, imports of oilseed meals and vegetable oils are also lower than in the baseline.

Effects on world market prices are shown in Table 6. In general, price changes on international markets are found to be modest. At 0.6% on average, the strongest increase in world markets is found for wheat, while the increases for coarse grains and oilseeds are less pronounced at around 0.2%. Following higher than baseline rice imports in the early implementation years, but a reduction in rice imports in later years, world rice prices are simulated to first increase vis-à-vis the baseline, but to fall below baseline levels towards the end of the simulation period. Prices for vegetable oils are increased by 0.3% on average, whereas meal prices are largely unchanged.

Table 6. Impact of the CAP reform on world prices for crops, assuming maximum decoupling, 2004-08 (% change from the baseline)

	2004	2005	2006	2007	2008
Wheat	-0.2	1.5	0.8	0.5	0.3
Coarse grains	-0.1	0.5	0.3	0.3	0.1
Rice	-0.1	0.7	0.4	-0.4	-0.7
Oilseeds	-0.1	0.2	0.3	0.0	0.3
Oilseed meal	-0.3	0.1	0.1	-0.1	0.3
Vegetable oils	0.1	0.3	0.5	0.4	0.4

Source: AGLINK simulation results.

Even though the simulation period ends in 2008, the results suggest that decoupling the former direct payments has a smaller impact in the longer run than in the initial years of the reform with respect to the market situation which would have prevailed had the CAP 2000 Agenda (the baseline) been maintained. Changes in feed markets due to the new regime in the livestock sector are, however, not completely taken into account within the simulation period (see next section). Lower long-term beef production, partly offset by higher non-ruminant production, are likely to affect feed use and hence exportability of wheat and particularly coarse grains to some degree.

18. It is interesting to note the initial reduction of wheat feed use in 2004 that follows the abolition of rye intervention and consequent pressures on coarse grain prices. In contrast to later years, wheat exports are therefore simulated to increase in the first year of the implementation of the reform.

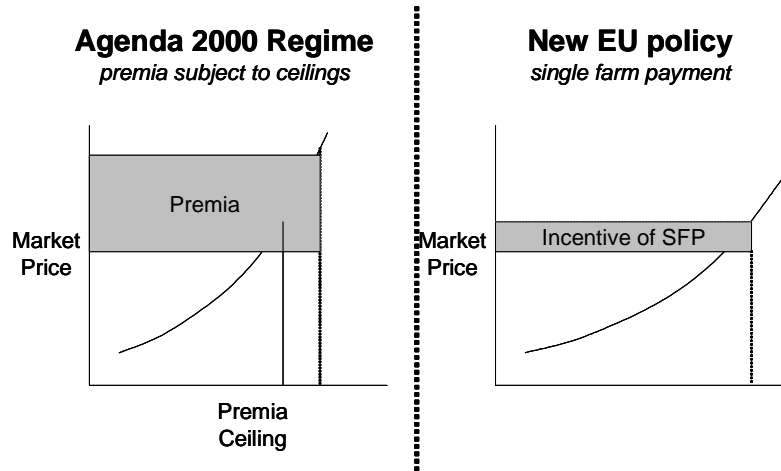
Meat market effects of maximum decoupling decisions

Meat market effects of the CAP reform relative to the baseline are presented in Table 7. While changes in crop and beef payments directly affect beef, sheep and goat production, other meat markets, such as those for poultrymeat and pigmeat, also respond.

Following the conversion of area and headage payments into the SFP in 2005, beef production receives lower incentives compared to the baseline. The impact of the conversion to the SFP is limited though by the fact that, in the baseline, increases in production were constrained by ceilings on the number of animals entitled to receive headage payments. With the SFP, although the production incentive is, on average, much lower, there are no more production limits of this nature. The change in incentives from a headage payment with a production ceiling to a lower rate payment without a ceiling is illustrated in Figure 3.¹⁹ As a result of lower incentives to beef production, producers will gradually reduce milk and beef cow inventories by increasing the slaughter of animals. In consequence, beef production increases moderately in the short term. The decline in production, which starts in 2007/08, should build over time as the herd reduction progresses. While AGLINK accounts for the herd dynamics, the simulation period is too short to show the longer term impact of these scenarios. This delayed, longer term impact has, however, been reported in similar analysis published by other sources. In time, the increase in domestic prices should reinforce market returns from beef production and bring an end to the decline in beef production.

Decoupling of the various beef payments does not initially change export levels. The decline in production at the end of the period is expected to result in a 1.7% increase in beef imports despite the tariff-rate quota (TRQ). Currently, some beef imports with above quota duty are entering the EU market outside the TRQ. These quantities are expected to decrease in the early years of the simulation period when prices are low, and then to increase when domestic market prices start to rise.

Figure 3. Hypothetical changes in production incentives



Source: OECD Secretariat.

19. It should be noted that payment ceilings act in a way similar to quotas. The extent to which elimination of the commodity-specific payments eliminates ceiling “rents” before beginning to affect production is not modelled in AGLINK.

The increase in EU beef prices lead consumers to shift away from beef consumption to other meats. The slight increase in pigmeat at the end of the simulation period results in higher pork prices compared to the baseline. Most of the additional consumption is expected to be supplied by higher domestic production, but exports fall slightly. A similar response is expected for poultry markets in the longer term, but it does not materialise during the simulation period.

**Table 7. Impact of the CAP reform on EU meat markets,
assuming maximum decoupling, 2004-08
(%change from the baseline)**

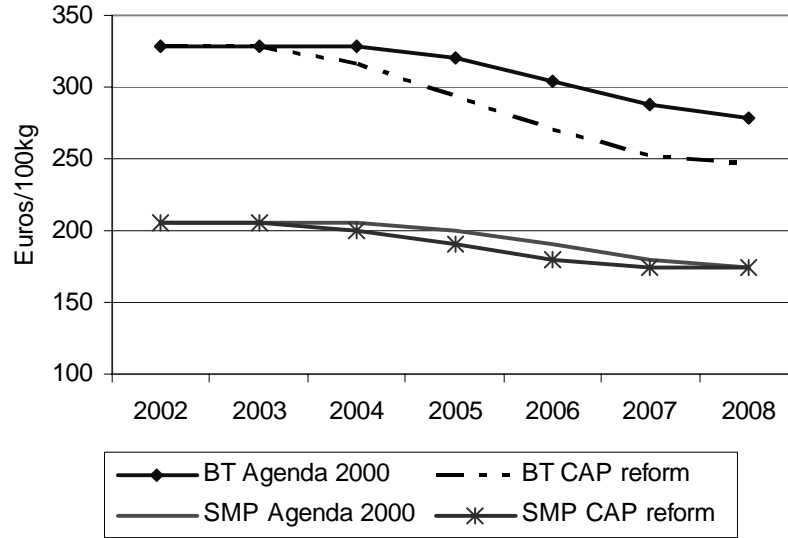
		2004	2005	2006	2007	2008
Beef	Beef cow inventory	-0.2	1.0	-1.0	-2.4	-3.2
	Milk cow inventory	0.1	-2.5	-2.2	-1.6	-0.9
	Total production	0.1	1.4	1.0	0.0	-0.6
	Total consumption	0.1	1.2	0.9	0.0	-0.5
	Exports	0.0	0.0	0.0	0.0	0.0
	Imports	0.0	-3.8	-1.7	0.2	1.7
	Domestic price	-0.9	-5.5	-3.4	0.9	2.7
	Pig meat	Production	0.0	-0.3	-0.7	-0.4
Total consumption		0.0	-0.4	-0.7	-0.4	0.1
Exports		0.1	0.5	0.3	-0.2	-0.3
Domestic price		-0.8	-3.3	-0.7	1.7	1.8
Poultry meat	Production	-0.1	-0.5	-0.7	-0.4	0.0
	Total consumption	-0.1	-0.6	-0.7	-0.4	0.0

Source: AGLINK simulation results.

Effects on the dairy market

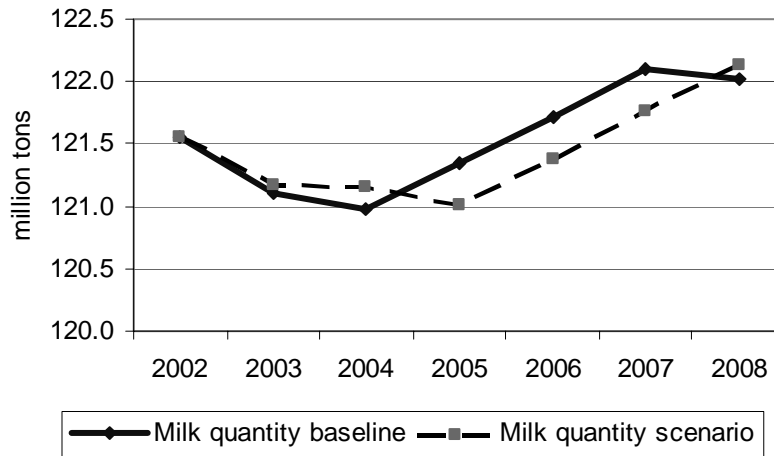
The impact of the 2003 CAP reform on the dairy sector is relatively modest because **the baseline already incorporates Agenda 2000 decisions**. The main elements of the reform, such as the introduction of a payment based on milk output, intervention price cuts and main quota increases, were already agreed under Agenda 2000. This is illustrated by Figures 4 and 5, which compare assumptions for intervention prices and production levels (equal to quota) in the baseline and the CAP reform scenarios. It should be recalled that much of the Berlin Agreement as it pertains to the dairy sector remains to be implemented. Its full implementation will certainly have a significant impact on the dairy market, even though the above analysis shows that the quota remains binding.

Figure 4. Butter and SMP intervention prices cuts under baseline (Agenda 2000) and CAP reform conditions



Source: AGLINK analysis.

Figure 5. Milk production assumptions under baseline (Agenda 2000) and CAP reform conditions



Source: AGLINK analysis.

The results presented in Table 8 indicate that the additional 10% cut in intervention prices of butter beyond the Agenda 2000 agreement would reduce the domestic price of butter by around 7% by the end of the simulation period. In response to the lower price, butter consumption would increase while production would decrease by less than 1%. With the additional intervention price cut the subsidised exports would be reduced by 16 to 19%. The cut in intervention prices for SMP will be implemented a year earlier relative to Agenda 2000. However, the reduction in butter production and increased demand for non fat solids in other dairy products will reduce production of SMP and drive up the SMP price by 1 to 2% over the medium term relative to the baseline. Cheese prices in the EU will drop only modestly (by around

2%) and production will increase by about 1% due to higher quantities of milk channelled to the relatively more profitable cheese production. WMP prices will be reduced somewhat more compared to cheese prices, with a corresponding increase in consumption and decrease in production.

Compared to the Agenda 2000 outcome, the CAP reform scenario indicates that milk producer prices would fall by around 2.6% although the intervention milk price equivalent (IMPE)²⁰ will be reduced by about 6%. This difference stems from the fact that the domestic price of butter would fall by less than the butter intervention price while the SMP price would rise slightly. The impact of different direct payment decoupling assumptions on the dairy sector is negligible. In this scenario, the quota remains binding and the marginal effect of direct payments on milk production is zero.

The additional cuts in butter intervention prices and subsequent reduction of subsidised exports for all dairy products strengthen world dairy product prices (Table 9). This is true especially (as expected) for butter where world price would increase by more than 3% compared to the baseline at the end of the simulation period. The increase in world prices for cheese and WMP is smaller compared to butter world prices while the world price of SMP would change very little.

Overall, the CAP reform in the medium term would have only a modest impact on the dairy sector as compared to the status quo — Agenda 2000. The significant impact comes largely from the additional 10% cut in butter intervention prices and, to a much smaller extent, from the slight increase in milk quota relative to Agenda 2000.

20. The methodology for calculating this milk price equivalent is defined by the FAO.

**Table 8. Impact of the CAP reform on EU dairy markets,
assuming maximum decoupling, 2004-08
(% change from the baseline)**

		2004	2005	2006	2007	2008
Butter	Price	-1.8	-2.7	-5.1	-6.1	-6.8
	Consumption	0.2	0.3	0.5	0.6	0.7
	Production	-0.3	-1.5	-1.4	-1.4	-1.0
	Exports	-4.5	-15.5	-17.5	-19.3	-16.6
SMP	Price	0.1	0.9	0.3	1.2	2.0
	Consumption	-0.1	-1.7	-1.5	-2.4	-3.3
	Production	-1.7	-5.5	-5.3	-5.1	-4.5
	Exports	-7.6	-19.2	-21.4	-16.5	-7.7
Cheese	Price	-0.6	-0.9	-1.9	-2.2	-2.0
	Consumption	0.4	0.6	1.4	1.7	1.5
	Production	0.4	0.4	0.9	1.0	1.2
	Exports	0.0	-2.5	-7.5	-9.5	-5.6
WMP	Price	-0.6	-2.5	-6.4	-5.9	-2.8
	Consumption	0.1	0.4	1.0	0.9	0.4
	Production	0.0	-3.3	-9.4	-11.1	-6.2
	Exports	0.0	-6.0	-17.8	-21.8	-12.4
Milk	Price	-1.0	-1.0	-2.7	-2.7	-2.6
	IMPE ¹	-3.3	-7.4	-9.0	-8.0	-6.1
	Consumption	0.4	0.4	1.2	1.2	1.1
	Production	0.2	-0.3	-0.3	-0.3	0.1

SMP: Skimmed milk powder. WMP: Whole milk powder.

1. Intervention milk price equivalent.

Source: AGLINK simulation results.

**Table 9. Impact of the CAP reform on world prices for dairy products,
assuming maximum decoupling, 2004-08 (% change from the baseline)**

	2004	2005	2006	2007	2008
Butter	0.2	1.1	2.3	3.7	3.4
Cheese	-0.2	0.4	1.7	1.6	0.6
SMP	0.5	1.0	1.1	0.5	-0.3
WMP	-0.1	1.6	4.1	3.7	1.1

SMP: Skimmed milk powder. WMP: Whole milk powder.

Source: AGLINK simulation results.

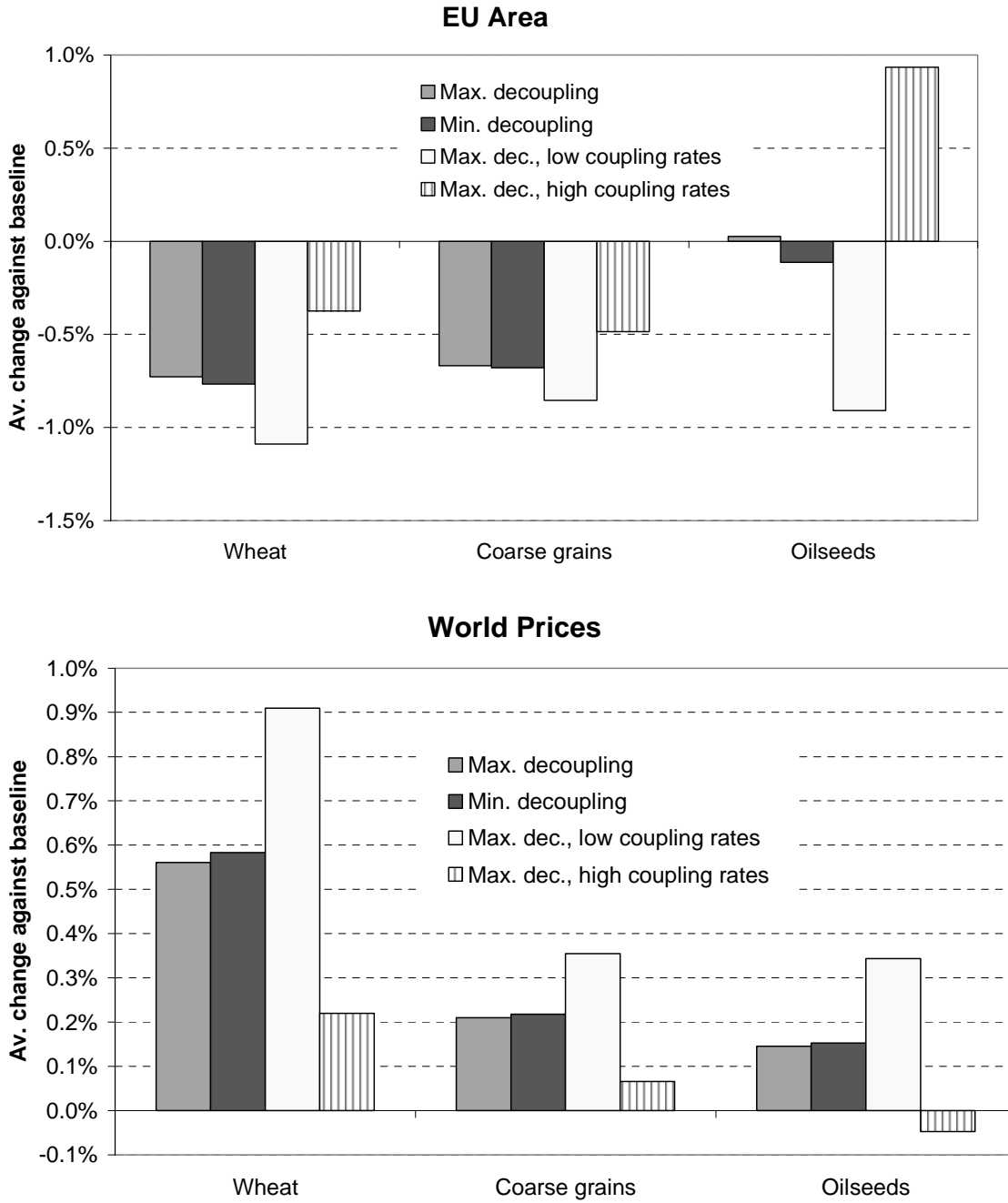
Market effects of minimum decoupling decisions

This scenario analyses market affects if all Member States decide to leave the maximum amount of payments allowed outside the SFP (minimum decoupling scenario). In particular, 25% of the area payments for crops and 40% of beef premiums would remain commodity-specific, while the new dairy payments would be included in the SFP only from 2007. Compared to the first scenario, the level of the SFP would accordingly be lower by almost 40% in 2005 and 2006, and by almost 30% in 2007 and 2008 (Box 4).

While the remaining area payments for cereals and oilseeds provide an incentive to maintain crop production, any positive effect on production is offset by payments that remain linked to animal numbers, in particular to bovine animals, for which the per hectare equivalent rate is higher than for cereals and oilseeds. Under the minimum decoupling scenario, total cereal and oilseed area is therefore estimated to decline slightly more than with maximum decoupling in the initial years of the simulation period when the SFP is significantly reduced. From 2007, cereal and oilseed area, and hence production changes, are almost the same as in the preceding case of maximum decoupling, with slightly stronger declines for cereals, and a small decrease rather than increase for oilseeds. On average over the simulation period, the decline in area used for wheat and coarse grains is about the same in both scenarios, while the oilseed area slightly decreases in the minimum decoupling scenario compared to a negligible increase in the maximum decoupling scenario (Figure 6). Consequently, the positive impact on world prices of wheat, coarse grains and oilseeds would become somewhat larger, but the differences are negligible.

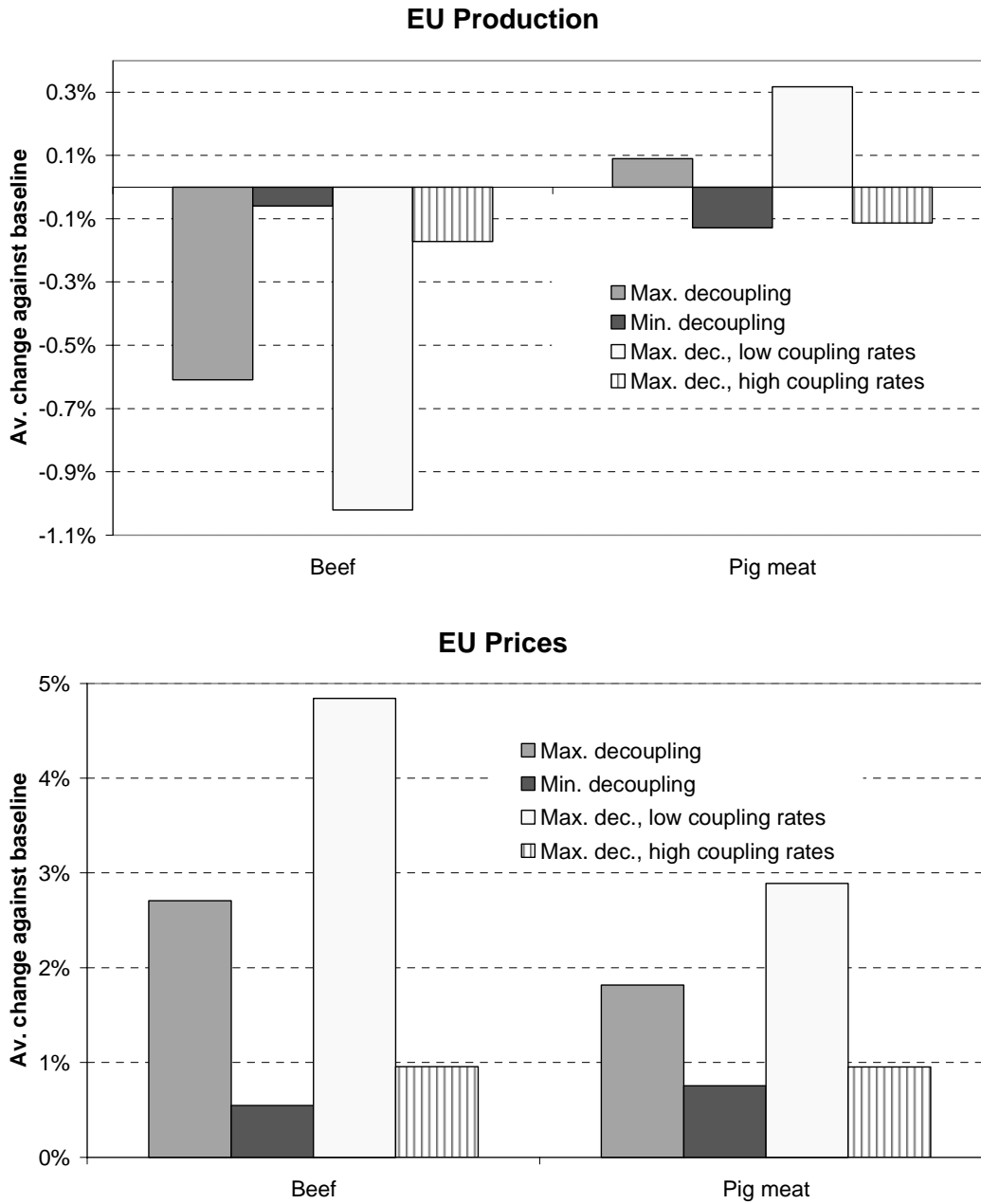
Beef production is estimated to be reduced by less if the maximum possible share of beef payments is kept linked to beef production. However, the difference is relatively small due to the application of ceilings on headage payments that impose direct limits on the support accruing to beef producers in total, relative to the SFP, even if the payments are more closely tied to production. Under these assumptions, beef production is reduced by less than 0.1% at the end of the simulation period compared to 0.6% with maximum decoupling. With the smaller price increase, consumption is estimated to shift less significantly to other meats, the price of which would also rise less (Figure 7).

Figure 6. CAP reform impact on cereal and oilseed markets under alternative assumptions concerning decoupling, average 2004-08



Source: AGLINK simulation results.

Figure 7. CAP reform impact on EU meat markets under alternative assumptions concerning decoupling, 2008



Source: AGLINK simulation results.

Sensitivity analysis: the implications of different assumptions with respect to the degree of decoupling of the SFP

The analysis discussed so far is based on parameters describing the impact area payments and SFP have on crop production relative to price support. These parameters are 0.14 and 0.06, respectively, implying that the production effects of those payments are 14% and 6% of the impact of market price

support.²¹ As is the case with many other parameters in empirical studies, there is some uncertainty about these values. It was therefore decided to carry out a sensitivity analysis. Indeed, for the policies in question, which convert area and headage payments into the SFP, the difference between the two parameters is of particular interest. The sensitivity analysis therefore applies parameters of 0.02 and 0.10 for the SFP, rather than the initial 0.06. In other words, the difference between the parameter for area payments (0.14) and the one for the SFP is either increased or reduced by 50%. Again, the same parameters are used to represent the impact of the SFP on beef production into a price-equivalent production effect.

As can be seen from Figure 6, the actual degree of residual coupling of the SFP relative to that of area payments has a significant impact on the market outcome for crops, with effects from changed parameters fairly symmetric. With a lower degree of residual coupling of the SFP, area for wheat and coarse grains would decline by 1.1% and 0.9% respectively, on average, compared to the baseline, whereas with the higher parameter, the average decline would be as small as 0.4% for wheat and 0.5% for coarse grains. The resulting impact on world prices would also be stronger with the lower coupling rate. In relative terms, the range is larger for oilseeds, but given the smaller area devoted to these crops, absolute ranges are similar.

Meat markets show significant sensitivity with respect to the value of the coupling parameter at the end of the period. In 2008, beef production is 1% lower than in the baseline, if a lower coupling rate is assumed, compared to a 0.15% decrease with an assumed higher coupling rate. At the same time, beef prices are estimated to increase by close to 5% compared to the baseline with a lower coupling rate, and by about 1% with a higher coupling rate. The difference in impact between the lower and higher coupling rates is also significant for pigmeat prices (2 percentage points in 2008).

Comparison between PEM and AGLINK results

PEM and AGLINK analysis indicate changes that go in the same direction but are of different magnitude. Differences between PEM and AGLINK analysis (reported mainly in Tables 3, 5 and 6) can be explained by four main factors. First, the models are of a different nature (see previous section): PEM is a comparative static model where inputs and outputs are represented over a medium-term (*e.g.* 5 years) adjustment period, while AGLINK is a dynamic model of commodity markets, which takes account of intertemporal effects. Second, as a result, some parameter values differ between the two models. Third, the range of commodities differs and, in particular, the PEM model does not include the beef sector. Fourth, results are not compared to the same base. The percentage changes in PEM compare the situation following the changes to the initial situation of a base year that is constructed from historic PSE data, while changes in AGLINK are expressed in relation to a forward-looking baseline. In particular, the AGLINK baseline incorporates changes in the dairy sector decided as part of Agenda 2000, while the PEM scenario starts from the 2002 situation. In both cases, results are partial and do not represent all agricultural sectors and all changes in the CAP reform, but they help to understand the mechanisms driving policy impacts.

PSE analysis: Impact on support level and composition

CAP reform changes applied as described in Box 5 would lead to a significant reduction in the MPS for milk and, to a much lesser extent, wheat MPS, while rice MPS is eliminated (Table 10). Conversely, the MPS for beef would increase as the producer price for beef is 2.7% higher at the end of the simulation period *i.e.* 2008 (compared to the baseline) in the maximum decoupling scenario because of the decrease in production and the maintenance of some trade barriers. As a result, **total MPS** would be about 11% lower than its 2002 level, both with maximum and minimum decoupling scenarios (Table 11). The decrease in total MPS is slightly stronger in the minimum decoupling scenario as the increase in the producer price (and thus MPS) for beef is less (0.5%) than in the maximum decoupling scenario. The impact on MPS is

21. Dewbre *et al.* (2001) p. 1212.

based on assumptions on milk markets, in particular regarding the decline in milk producer price following the reduction in intervention prices for butter and skimmed milk powder.

Table 10. Changes in market price support by commodity

	2002 base year	Level		Change in absolute value compared to the base		% change	
		Maximum decoupling	Minimum decoupling	Maximum decoupling	Minimum decoupling	Maximum decoupling	Minimum decoupling
Unit	EUR mn	EUR mn	EUR mn	EUR mn	EUR mn	%	%
Wheat	199	153	155	-47	-44	-24	-22
Coarse grains	290	295	297	4	6	2	2
Rice	164	0	0	-164	-164	-100	-100
Milk	17 310	10 574	10 573	-6 736	-6 737	-39	-39
Beef	12 665	13 116	12 778	451	114	4	1

Source: Secretariat calculations based on OECD PSE/CSE database and AGLINK scenarios.

The level of **budgetary payments** increases with the introduction of the milk output payment (EUR 4.3 billion), which drives the bulk of the change. In relative terms, new payments for nuts and for dried fodder and the reduction in payments for durum wheat and rice have more modest effects on the total level of expenditures.

Overall, the level of **support to producers** (as measured by the Producer Support Estimate, PSE) would be close to 2% lower than in the base year, in both scenarios, as the increase in payments is lower than the decrease in MPS. This is mainly because the milk payment is assumed not to offset the assumed decline in the producer price for milk. The decrease would be slightly more pronounced in the minimum decoupling scenario because of the slightly lower decrease in total MPS due to a lower increase in MPS for beef. By definition, the total level of payments is the same in both scenarios.

As intended, the estimated impact of the reform on the level of support is modest but there are large changes in the **composition of support** to producers (Table 12 and Figure 8). When the decoupling of current payments is assumed to be at the maximum permitted, the share of payments based on area planted or animal numbers in the total PSE is reduced from 26% to 6%, while the share of payments based on historical entitlements increases from 1% to 27% as the SFP is classified in this category of payments more decoupled from current parameters. As expected, this shift is less pronounced when decoupling is minimal: payments based on historical entitlements reach 20%, while payments based on area planted or animal numbers still account for 12% of total support to producers.

Table 11. Impact of the CAP reform on PSE/TSE levels

	2002	Maximum	Change compared to		Minimum	Change compared to	
	base year	decoupling	base year		decoupling	base year	
	Eur mn	Eur mn	Eur mn	%	Eur mn	Eur mn	%
Total value of production (at farm gate)	247 147	241 215	-5 932	-2.4	240 888	-6 259	-2.5
Total value of consumption (at farm gate)	191 273	191 273	0	0.0	191 273	0	0.0
Producer Support Estimate (PSE)	105 519	103 558	-1 961	-1.9	103 225	-2 294	-2.2
A. Market price support	61 218	54 727	-6 491	-10.6	54 394	-6 824	-11.1
B. Payments based on output	3 821	3 596	-226	-5.9	3 601	-220	-5.8
C. Payments based on area planted/animal numbers	27 751	5 936	-21 815	-78.6	12 601	-15 151	-54.6
D. Payments based on historical entitlements	599	27 924	27 326	4 565	20 457	19 858	3 317
E. Payments based on input use	7 643	7 495	-148	-1.9	7 549	-94	-1.2
F. Payments based on input constraints	4 432	3 825	-607	-13.7	4 569	137	3.1
G. Payments based on overall farming income	0	0	0	0.0	0	0	0.0
H. Miscellaneous payments	55	55	0	0.0	55	0	0.0
X. Total payments	44 301	48 831	4 530	10.2	48 831	4 530	10.2
Percentage PSE	36	36	-0.5	-1.4	36	-0.6	-1.6
Producer NAC	1.57	1.56	0.0	-0.8	1.55	0.0	-0.9
General Services Support Estimate (GSSE)	9 788	9 975	187	1.9	9 975	187	1.9
I. Research and development	1 486	1 486	0	0.0	1 486	0	0.0
J. Agricultural schools	1 158	1 158	0	0.0	1 158	0	0.0
K. Inspection services	258	258	0	0.0	258	0	0.0
L. Infrastructure	1 987	2 059	72	3.6	2 059	72	3.6
M. Marketing and promotion	3 370	3 485	115	3.4	3 485	115	3.4
N. Public stockholding	1 134	1 134	0	0.0	1 134	0	0.0
O. Miscellaneous	397	397	0	0.0	397	0	0.0
Consumer Support Estimate (CSE)	-52 672	-46 780	5 893	-11.2	-46 446	6 226	-11.8
P. Transfers to producers from consumers (-)	-56 626	-50 765	5 861	-10.4	-50 435	6 191	-10.9
Q. Other transfers from consumers (-)	-179	-179	0	-0.2	-179	0	-0.2
R. Transfers to consumers from taxpayers	3 843	3 889	46	1.2	3 889	46	1.2
S. Excess feed cost	290	276	-14	-4.9	279	-11	-4.0
Percentage CSE	-28	-25	3	-11.2	-25	3	-11.8
Consumer NAC	1.39	1.33	0	-4.2	1.33	0	-4.4
Total Support Estimate (TSE)	119 150	117 422	-1 729	-1.5	117 089	-2 062	-1.7

Source: Secretariat calculations based on OECD PSE/CSE database and AGLINK scenario.

Apart from the introduction of the SFP, other factors changing the composition of producer support include the decrease in MPS described above and the **modulation** of most payments (including the SFP and remaining commodity payments). Funds collected from modulation amount to around EUR 1.2 billion. They are redistributed to existing and new measures under the RDR as explained in Box 5. This redistribution affects most categories of payments in the PSE and payments under “infrastructure” and “marketing/promotion” in the GSSE.

As a result, the share of MPS decreases in both scenarios by 5 percentage points and the share of payments based on output, input use and input constraints remains relatively stable. In the case of payments based on input use and input constraints, the reduction due to the transfer of some payments (respectively payment for dried fodder and slaughter premiums) into the SFP is almost offset by an increase in payments for current and new measures benefiting from modulation, *i.e.* agri-environmental

measures, afforestation, assistance to young farmers, farm audit payments, producer aid to meet quality requirements, producer payments to comply with standards, and animal welfare payments.

Budgetary expenditures on **general services** to the sector as measured by the GSSE (General Services Support Estimate) would be higher (by about 2%) than in the base period in both scenarios. Both current infrastructure programmes and the new support to producer groups for the promotion of quality products under marketing/promotion would receive higher expenditures from modulation.

Finally, the **Total Support Estimate** (TSE) would decrease by 1.5%, or about EUR 1.7 billion, compared to the base year if the maximum rate of decoupling was applied in all countries. As in the case of the PSE, there is no difference in the total level of payments between the maximum and minimum scenarios, but the level of MPS differs, in particular for beef.

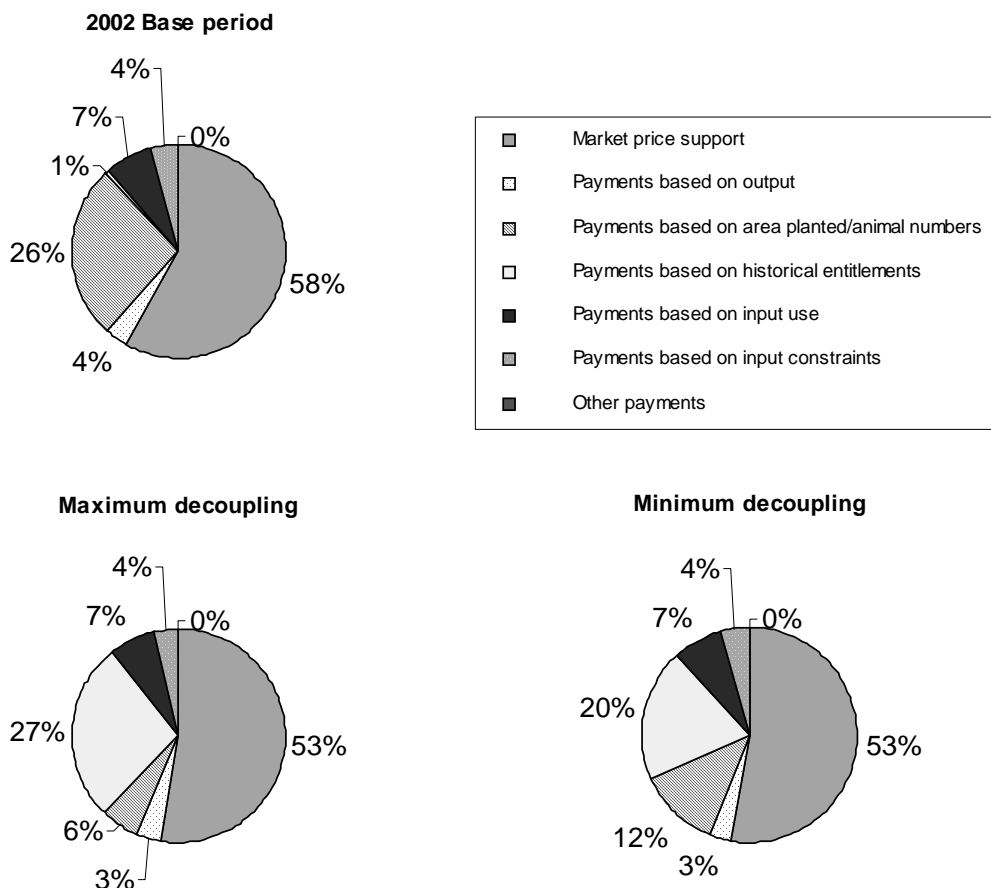
In summary, the change in the level of support is modest and due mainly to the assumption on the decline in the producer price for milk. However, there is a significant change in the composition of producer support towards more decoupled payments. Differences in the level between the two decoupling scenarios are minor but with the adoption of the maximum rate of decoupling, the share of the SFP, classified as a payment based on historical entitlement, is larger than with the adoption of a minimum rate of decoupling.

Table 12. Impact of the CAP reform on the composition of the PSE and GSSE (%)

	2002 base year	Maximum decoupling	Minimum decoupling
Producer Support Estimate (PSE)	100	100	100
A. Market price support	58.0	52.8	52.7
B. Payments based on output	3.6	3.5	3.5
C. Payments based on area planted/animal numbers	26.3	5.7	12.2
D. Payments based on historical entitlements	0.6	27.0	19.8
E. Payments based on input use	7.2	7.2	7.3
F. Payments based on input constraints	4.2	3.7	4.4
G. Payments based on overall farming income	0.0	0.0	0.0
H. Miscellaneous payments	0.1	0.1	0.1
General Services Support Estimate (GSSE)	100	100	100
I. Research and development	15.2	14.9	14.9
J. Agricultural schools	11.8	11.6	11.6
K. Inspection services	2.6	2.6	2.6
L. Infrastructure	20.3	20.6	20.6
M. Marketing and promotion	34.4	34.9	34.9
N. Public stockholding	11.6	11.4	11.4
O. Miscellaneous	4.1	4.0	4.0

Source: Secretariat calculations based on OECD PSE/CSE database and AGLINK scenario.

Figure 8. Composition of the PSE in the base year and under the two decoupling scenarios



Source: Table 12.

5. Qualitative evaluation of other aspects of the reform

The quantitative analysis presented here focuses on market effects of the reform, but many provisions address issues related to agri-environmental impacts, food safety, food quality, and rural development (in particular, land management and regional development). Such impacts although likely to be significant are difficult to evaluate at this stage. First, a lot of flexibility is given to Member States to set specific criteria and implementation details matter in such areas. Second, it is not yet known how these issues will be addressed. Third, *ex ante* evaluation is difficult in such areas and only an *ex post* examination can assess the effectiveness of measures. Such impacts will have to be carefully monitored and policies will have to be evaluated with regard to such concerns. On-going work at the OECD and elsewhere should help with these evaluations.

Regarding cross-compliance, statutory management requirements are defined at the EU level for public, animal and plant health, the environment, and animal welfare. In addition, receiving full payment is conditional on land being maintained in good agricultural and environmental conditions. Payments that are conditional on cross-compliance requirements should help to reduce environmental damage from agriculture, in contrast to market price support and other measures which probably cause it. However, countries should carefully target specific environmental conditions that typically vary across locations. The

effectiveness of the provisions will depend on how stringent the cross-compliance requirements will be, how well they are targeted to local requirements, and how strictly they are enforced.

As part of a positive trend to re-balance funds from the first to second pillar, the Rural Development Regulation, which benefits almost exclusively the agricultural sector and agricultural producers rather than other activities in rural areas,²² is reinforced with new measures being introduced and additional funds becoming available from modulation. The attribution of funds from the first (CMO measures) to the second pillar (RDR measures) has the potential to strengthen efforts to improve the environment and farm structures, but the amount of modulated funds is modest, relative to all payments to producers, and the fundamental imbalance remains (RDR measures currently account for 10% of agricultural expenditures)..

New RDR measures and changes to existing measures could provide further opportunities for adjusting production to societal and consumer demand, in particular with regard to food and environmental quality, food safety, and animal welfare. For example, assistance for the adoption of high animal welfare standards and the promotion of food quality is expected to help farmer responsiveness to developments in consumer demand, even though product quality is something which could be rewarded through the market without government intervention. Support for innovative approaches in food processing should also improve the marketing of products. In these areas, the reward should ultimately come from the market. The fact that support to adjust to new standards is degressive and temporary is consistent with that idea. Support to advisory services could be beneficial to the extent it contributes to the achievement of the policy objectives themselves because farmers are better informed. In some countries, the reinforcement of assistance to young farmers contributes to the installation of family farms and therefore to rural development objectives.

Finally, the extent to which the reform simplifies the administration of the CAP remains unclear. It is expected that the submission of single applications will simplify administrative tasks. The establishment of a single system to record the identity of farmers submitting aid applications subject to the integrated system in each Member country and to include, in a computerised database, information about parcels, applications, payment entitlements and actual payments should simplify controls. Improvements in information and reporting should also facilitate the evaluation of programmes. However, verification of compliance and delivery could still be a challenge, and the opportunity to simplify the administrative system will be lost if a dual system of payments is maintained.

6. Summary and evaluation

This evaluation is preliminary in the sense that some implementation parameters of the reform package have not yet been decided by all EU Member countries. It is also partial to the extent that some commodities are excluded from the analysis presented here (in particular, the PEM analysis excludes the beef sector) and some provisions, regarding cross-compliance for example, are not precise enough to be evaluated quantitatively. In any case, it should be kept in mind that the results of this scenario analysis depend on many parameters such as the fact that the European Union is treated as a single entity, the choice of the reference period, the assumptions about macroeconomic conditions, the baseline levels, the modelling structure and elasticities, the choice of country implementation options, and the way the impact of payments on production (“decoupling”) has been represented. Moreover, the regional option was not taken into account. Finally, neither has the impact of enlargement been taken into account. The technical limits of the present analysis are outlined in the last paragraph of Section 2.

22. Agricultural producers receive over 95% of EU expenditures under this regulation as only few measures aim at alternative non-farm developments in rural areas.

Overall, results of the quantitative analysis indicate modest reductions in production of most commodities, with somewhat larger percentage reductions in net exports. As planned by the reform, there will also be modest changes in levels of support but large changes in the composition of support to producers as a significant part of expenditures becomes less coupled to production and trade, and less commodity specific.

The main expected impacts of the reform are:

- A clear movement from crop land to pasture land.
- A significant extensification, and in particular a reduction in the density of cows per hectare.
- An initial decline in the producer price for cereals, followed by a recovery to baseline levels for wheat and a slight increase for coarse grains.
- A decrease in beef inventories, which leads to lower production at the end of the period. As a result, domestic producer prices initially fall below the baseline level and start rising above at the end of the period. This leads to higher MPS for beef than in the baseline.
- Limited changes in dairy markets because the production quota remains binding and because, in the AGLINK scenario, Agenda 2000 is already incorporated in the baseline. However, the impact on the type of support and on the welfare for those working in the sector are significant compared to 2002 because they incorporate Agenda 2000 measures as well as those of the 2003 reform.
- Small increases in world prices for crops, except for rice because of lower EU imports as domestic prices decrease.

Overall, in accordance with the objectives of the 2003 CAP reform, the composition of the support will be significantly modified but with no change in the level of support. MPS is reduced and the share of non-commodity specific payments increased, especially if all EU Member countries opt for the maximum decoupling of payments. Total welfare (as estimated by the PEM partial analysis) increases in the EU. There is a net gain for users. Although dairy producers' welfare is reduced because of a lower quota rent which is not offset by the payment, all other producers gain from higher beef prices and an improved transfer efficiency as a result of the implementation of the SFP. In addition, the increase in land rent is higher than the reduction in quota rent and capital. On the other hand, there is a decrease in taxpayers' welfare from the introduction of the milk payment and a slight reduction in input suppliers' welfare because of greater extensification.

The recent CAP reform will certainly improve the performance of the EU's agricultural policies. It goes in the direction desired by Ministers as expressed in OECD reform principles (OECD, 1998). As a result of the establishment of the single farm payment based on historical entitlements, domestic market forces play a greater role in guiding the allocation of resources among a large range of commodities. As a welcome positive effect of this reform, distortions to international trade are reduced. Improvements in income transfer efficiency should also contribute to actually increasing farm incomes. In order to benefit from these positive effects of decoupling, EU Member countries would gain most from making maximum use of the scope for converting commodity-linked payments into the new single farm payment. This would also be an opportunity to make full use of the potential to simplify administrative tasks, another expected benefit of moving to a SFP. However, some EU Member States have decided to maintain a certain level of coupling in order to limit what they consider as negative effects at the regional level reflecting land management concerns.

Nevertheless, even after the reform, significant levels of MPS remain, including in the reformed sectors, where domestic and trade measures still prevent market forces from fully guiding production decisions, and in some sectors which are not included in this reform package. It should be noted, however,

that negotiations are currently underway for commodities which are not part of this reform (sugar, olive oil, tobacco, cotton and hop) These reforms, if undertaken in the same spirit as the 2003 reform, should significantly reduce the distorting nature of support.

In view of the fact that a reduction in support was not the objective of the reform, it is expected that excess resources in production factors will remain in the agricultural sector. It should, however, also be noted that measures have been taken to limit the budgetary cost of the CAP. Indeed, a financial discipline mechanism allows for payment levels to be reduced automatically if expenditures exceed the budget ceiling in the future. This mechanism is expected to be triggered as CAP payments will apply to a larger number of farmers after enlargement, and with the gradual increase in the payment rate in accession countries. The level of payments by farm in all Member States would then be reduced.

The foreseen shift from broad-based payments to expenditures on RDR measures (modulation) is another step in the direction of the principles established by OECD Ministers, as it opens up the possibility of moving towards more targeted policies. However, at an annual rate of 5% from 2007, receipts from modulation will amount to EUR 1.2 billion, a modest sum in comparison to total expenditures (about 1.2% of the EU PSE), but which nevertheless represent close to 30% of current RDR funds. It will modify to some extent the composition of the PSE and TSE. Some expenditures would be transferred from the PSE to the TSE, *i.e.* from payments to producers to payments to the sector, which potentially results in less distortions. However, most of these monies (about EUR 1 billion) represent payments to producers and as such remain a component of the PSE. It is difficult because of their specificity to gauge the net impact that such movements might have on market distortions.

In summary, 2003 CAP changes are going in the direction indicated by OECD Ministers towards greater market orientation and lower market distortions, mainly because of a more significant decoupling of payments from production. For the same reason, income transfer efficiency is improved. These benefits would be maximised if member countries were to make full use of the scope for decoupling although a number of countries have decided to maintain a certain degree of coupling in order to limit effects they consider negative at the regional level and to meet their land management concerns. The positive effects of the CAP reform could be further reinforced by a reduction in the level of support and improvements in market access. The reform makes provision for better targeting of payments in some areas, but the single farm payment, which is based on historical entitlements, remains largely linked to farm size. Hence, most support will continue to benefit larger, and often richer, farmers.²³ It should be recalled that reform negotiations are currently underway on unreformed commodity sectors.

23. See OECD (2003d).

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Annex 1.**REPRESENTATION OF EU POLICY MEASURES IN AGLINK**

This annex provides a description of the analytical methods employed to represent the various policies and assumptions in the AGLINK model to estimate the impact of the 2003 CAP reform on markets. These include

- a) Crop policies and assumptions
 - i) Cereal intervention prices
 - ii) Area compensation payments
 - iii) Single Farm Payment
 - iv) Representation of risk effects
- b) Beef policies
 - i) Headage payments for beef producers
 - ii) Single Farm Payment
- c) Dairy policies
 - i) Production quota
 - ii) Dairy product intervention prices
 - iii) Direct payments

a i) Intervention prices for wheat, coarse grains, and rice

Two elements of the reform specifically concerning the intervention system result in a *de-facto* reduction in the level of support due. First, the 50% cut in the monthly increment reduces the average intervention price for cereals by EUR 1.22 per tonne. Second, rye intervention is abolished. As the EU model of AGLINK does not represent intervention measures for individual coarse grains, this abolition results in a further reduction in the average coarse grain intervention price, which is estimated in Annex Table A1.1.¹ In contrast, the intervention price for rice is directly represented in the model, and is substantially reduced from EUR 298.35 per tonne to EUR 150 per tonne.

Cereal intervention prices do not directly influence EU market prices for wheat and coarse grains in AGLINK. Instead, they are driving factors for both intervention stocks, and subsidised cereal exports. Market prices for wheat and coarse grains in the EU are determined by the domestic market equilibrium. In contrast, the producer price for rice is determined by the intervention price level as long as it is above the world price level, while domestic consumer prices depend on the world price, import tariffs and the domestic producer price.

1. Rounding errors may cause inexact numbers in this description, as the final value was calculated without rounding.

**Annex Table A1.1. Impact of the abolition of the intervention for rye
on the average intervention price for coarse grains**

Line	Element	Unit	Amount / calculation	Result
(a)	Original cereals intervention price	EUR/t	101.31	
(b)	Cut in monthly reports	EUR/t	1.22	
(c)	Average cereals intervention price	EUR/t	(a) – (b)	100.09
(d)	Average export price of German rye, 1998-2002	EUR/t	71.38	
(e)	Assumed increase in world prices due to abolition of rye intervention	%	10	
(f)	Average EU export price of rye, assumed	EUR/t	(d) * (1 + (e))	78.52
(g)	Impact of rye intervention abolition on domestic rye price	EUR/t	(c) - (f)	21.58
(h)	Average share of rye in EU coarse grain production	%	5.31	
(i)	Effective reduction of average coarse grains intervention price due to abolition of rye intervention	EUR/t	(g) * (h)	1.15
(j)	Average effective coarse grains intervention price	EUR/t	(c) - (i)	98.95

Source: Secretariat's calculations.

a ii) Area compensation payments for crops

The level of area payments for cereals and oilseeds is not changed by the policy reform, whereas the payment level for rice producers increases substantially in 2004 when the rice intervention price is cut. However, most of the payments will become part of the SFP. Payments specific to cereal, oilseed and rice area will therefore be reduced or abolished, depending on further decisions by Member Countries, within limits set by the Commission (Table 2).

Area payments for cereals and oilseeds enter, together with average crop returns, the allocation equation for total area devoted to cereals and oilseeds. As these payments are known to have less impact on production than market returns, payments are weighted with a production ratio DF_{QP}^{PEM} taken from Dewbre *et al.* (2001), *i.e.* 0.14. With positive price elasticities of yields $\varepsilon_{YLD,PP}$ and zero assumed yield effects of area payments, the effective rates of decoupling used in the Aglink area equations DF_{AH}^{eff} need to be corrected depending on the area elasticity with respect to returns per hectare $\varepsilon_{AH,RH}$ to ensure consistency of production effects, according to the following formula:

$$DF_{AH}^{eff} = DF_{QP}^{PEM} * \frac{(\varepsilon_{AH,RH} * (1 + \varepsilon_{YLD,PP}) + \varepsilon_{YLD,PP})}{\varepsilon_{AH,RH}}$$

The parameter entering the area allocation equation for rice is based on the same ratio as for cereals and oilseeds, *i.e.* 0.14.

a iii) Single Farm Payment

In principle, the SFP affects the decision on the total land devoted to all eligible activities, including cereals, oilseeds, fodder crops, a list of other crops, pasture, and idling. So far, AGLINK takes the total land for cereals, oilseeds, fodder crops and pasture (other crops and idling are not represented in AGLINK) as exogenous. Therefore, the SFP enters the same equations as area payments, *i.e.* the allocation of total area devoted to cereals and oilseeds, and the equation for rice area. To reflect the lower degree of coupling as compared to the area payments, a lower production ratio of 0.06 is used, taken from Dewbre *et al.* (2001), and subject to some sensitivity analysis discussed in the main text. As in the case of area payments, the respective effective decoupling coefficients used in the area equations are calculated from this ratio to correct for the difference in the yield response compared to price support.

a iv) Representation of risk effects

Intervention prices reduce the revenue risk perceived by farmers as they offer a price floor in uncertain markets (Annex 2). As described in Annex 5 of OECD (2003b), risk premiums represent the degree to which incentive prices are lower than expected receipts due to the variability of prices (and thus revenues) creating a disincentive to produce for risk-averse farmers. Given an expected price, a reduction of the price variability will therefore increase production incentives and vice versa. Therefore, risk premiums are deducted from producer prices in the equations for effective returns for wheat, coarse grains, and rice.

As the risk premiums not only depend on policy parameters, but also on expected market prices, an iterative procedure in the simulations is required to ensure consistency. In line with the model assumption on producers' area allocation decisions, prices are assumed to be equal to expected prices in the assessment of risk premiums, so their effect on area allocation occurs with a one-year lag.

b i) Headage payments for beef producers

The rate of headage payments (premia) for beef producers is not changed by the policy reform. Headage payments specific to the beef sector are reduced or abolished to become part of the SFP, partly depending on further decisions by Member Countries. The limits (ceiling) on the number of claims have been revised for the suckler cow premium and the special premium.

b ii) Single Farm Payment

The levels of the different headage payments are currently calculated endogenously in the model, using marginal producer decision making. These payments are there after incorporated as an equivalent price gap in the inventory and production equations. The SFP introduced in 2005 affects production decisions on all eligible farming activities. In the beef production equation, the SFP therefore replaces part or the total of the coupled headage payments in the above specified equations. The SFP per head is equal to the SFP per hectare of eligible land divided by the weighted average stocking density in the baseline, taking into account the average carcass weight of each category of animals (beef, veal and sheep). As in the land use equation, a lower production ratio of 0.06 is used for the SFP.

c i) Milk quota increases

To facilitate the CAP reform analysis the milk production levels are recalculated from the baseline to reflect the one year delay in quota increase compared to the Agenda 2000 schedule. The calculation accounts also for an additional quota granted to Greece and Portugal. As the actual milk quota is tight to the milk-fat content, the production increases are adjusted for milk-fat growth over the baseline.

c ii) Dairy product intervention prices

The CAP reform reduces intervention prices for butter by 25% over four year period while Agenda 2000 proposal assumed 15% cut over three year period. The size of SMP intervention price cuts remains the same. However the price cuts for butter and SMP are to be implemented one year earlier as compared to Agenda 2000 schedule. Thus intervention prices, which are exogenous variables in AGLINK, are recalculated for both products. In viewing the levels of interventions prices it is important to note that the calendar year data are assumed in AGLINK thus the intervention price levels are recalculated from the marketing year levels.

The CAP reform abolishes target price of milk, which, however, does not have practical consequences for the EU dairy industry other than that the Commission would need to use another benchmark for calculating quota super levy and school milk aids. For AGLINK modelling purposes, the changes in the intervention milk price equivalent (IMPE) benchmark are calculated to reflect the reduction in support.

c iii) Direct payments and Single Farm Payment.

The milk payment under the CAP reform is higher than in Agenda 2000 to reflect the larger cut in the intervention price for butter. In the scenario, the quota remains binding and the marginal effect of the milk payment is zero. That is, the milk payment does not have a direct impact on milk production levels as the production remains determined by quotas. The same applied to the SFP over the baseline period.

*Annex 2.***METHODOLOGY TO DERIVE RISK PREMIUMS**

The main changes in the CAP reform that could create risk related effects are the reduction in the intervention prices for butter, SMP and rice and the 50% reduction in the monthly increments for the cereal intervention price, which is estimated to result in a 1.2% reduction in the annual average intervention price for cereals.

The main impact of an intervention price is not to increase the corresponding output price received by producers but to **truncate the distribution of prices** they face (producers are guaranteed they will not receive prices lower than the intervention price). Hence, the main impact of an intervention price is to increase the expected price for producers (*i.e.* the means of the distribution of prices they face) and to reduce the variability of these prices (*i.e.* the variance of the price distribution). As a result of the reductions in intervention prices, milk, rice and cereal producers might therefore face lower domestic prices than before and a higher variability of domestic prices for these commodities.

The same methodology used for the analysis of the risk impact in the US 2002 Farm Act was used to analyze risk effects of the 2003 CAP reform. It is applied in three consecutive steps:

- Domestic prices in the absence of market price support in the EU, *i.e.* reference border prices from the PSE database, are assumed to follow a normal distribution. The mean is equal to current border prices and a moving variance is calculated using 15 lags.
- This price distribution is truncated at 90% of the intervention price. A milk intervention price is calculated using butter and SMP intervention prices, following the Intervention Milk Price Equivalent (IMPE) methodology defined by the FAO. The variance of the truncated distribution is calculated using the methodology defined by Chavas and Holt (1991).
- Risk premiums are calculated using the same methodology as for the loan rates in the US 2002 Farm Act analysis contained in Annex 5 of OECD (2003b).

Table A2.1. shows the magnitude of the risk premium as a percentage of border prices. The decrease in risk reduction is very significant for rice, equivalent to an additional reduction of 15% in the incentive price. The impact on risk for milk and cereals, however, is negligible at 0.3% at maximum. The small change in the case of milk results from domestic price levels that are still well above world market prices. In these circumstances, price effects completely dominate over risk related effects. In the case of cereals the reduction in the average intervention price is too small to generate significant risk related effects.

**Annex Table A2.1. Risk impacts of CAP reform in 2003:
changes in risk premiums**

	Unit	Rice	Milk ¹	Wheat	Maize	Barley	Oats
2002 Producer price	EUR/t	285	313	116	129	106	116
2002 Border reference price	EUR/t	220	169	108	126	101	123
2002 Intervention price	EUR/t	298	284	101	101	101	101
CAP Reform Intervention price	EUR/t	150	256	100	100	100	100
Increase in the Coefficient of Variation (CV)	%	69	2	1	0	2	1
Change in risk premium as % of border reference price	%	-15	-0.01	-0.22	-0.01	-0.28	-0.12

Note: The increase in the CV and the risk premium for milk is calculated as an average of 2005-08.

Source: Secretariat's calculations.