

# **Reforming the CAP: A Partial Equilibrium Analysis of the MTR Proposals**

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# Reforming the CAP: A Partial Equilibrium Analysis of the MTR Proposals\*

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## Abstract

*In the Mid-Term Review (MTR), the European Commission proposed a series of changes to the Common Agricultural Policy (CAP). An important part of these changes was significant decoupling of support payments from production. In this paper, a partial equilibrium model of the EU agricultural sector is used to estimate the potential impacts of the MTR proposals on EU and world agricultural markets over the period 2004-2009. Effects of the MTR proposals are evaluated by comparing estimated outcomes under the proposals to those that would result under a current-policy baseline. The changes that are made in the MTR have the effect of reducing the production of the major commodities by varying amounts based on the importance of payments in production and the degree to which these payments are currently production inducing. For example, total area harvested for nine major crops falls by about 2 percent under the MTR proposals. In the livestock sector, however, where current payments are strongly coupled and form a large part of producers' income, the reductions in production are projected to be more significant.*

*Keywords:* Policy analysis; Mid-Term Review; Common Agricultural Policy

## 1. Introduction

In July 2002 the European Commission released its Mid-Term Review (MTR) document. The document went beyond providing a market outlook and review of the Agenda 2000 reforms, and suggested detailed reforms of the CAP. In particular the MTR proposed that most of the direct payments paid to producers be decoupled from production and paid on an area basis. In this paper an analysis of the impact of these proposals is presented, based on information provided by the European Commission between July and September 2002.

The basis for comparison is a set of baseline projections for EU agricultural markets that reflects the most recent information that was available in mid-2002. Although implications of the policy change are thought to be reasonably robust with regard to the changes in market conditions since then, events can cause sudden shifts in the market outlook, and all market projections should be treated as provisional.

In the first part of the paper the models used are briefly discussed. The main features of the MTR proposals as interpreted for this analysis are presented. The results of the simulation of the model for the major commodities are discussed in Section 4.

## **2. FAPRI models**

FAPRI produces analysis of agricultural policy changes using an integrated set of non-spatial partial equilibrium models developed for major agricultural markets. Current FAPRI models cover world markets for cereals, oilseeds, meats, dairy products, cotton, and sugar. The major trading countries are individually modelled, with the “rest of the world” aggregated into one region. The models produce estimates of production, consumption, and trade; in many cases the models also estimates domestic market prices, stocks, and other variables of interest.

The model that is used in this analysis has been developed in conjunction by FAPRI-Missouri for research conducted jointly with colleagues at Teagasc in Dublin and Queens University in Belfast (Westhoff and Young, 2001). The model provides country-level detail for France, Germany, Ireland, Italy, and the United Kingdom, while treating the other countries of the European Union as a group. Market prices in the various member countries are linked, but domestic supply and demand conditions affect cross-country price relationships. Net export supply for the European Union is the sum of the net export supplies (production plus beginning stocks minus domestic consumption minus ending stocks) of the member countries at a given set of prices. Net export demand for the European Union is a behavioural function of EU and world prices that also attempts to incorporate WTO limitations and plausible behaviour by the European Commission in establishing export restitutions and other measures affecting EU trade and prices. Domestic EU market prices are those that equate EU net export supply and demand.

The EU components of the model explicitly replicate important features of EU agricultural policy. For example, stocks accumulate when market prices fall to intervention levels. However, if market clearing prices are above intervention prices, reducing the support price has little effect. Set-aside restrictions reduce the amount of land devoted to production of cereals and oilseeds. Milk production in the EU is limited by the quota system in place. Payments in the livestock sector are included in such a way that they correctly replicate the effect that these payments have on the marginal decisions of producers.

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The model covers EU markets for soft wheat, durum, barley, maize, rapeseed, sunflowers, soybeans, beef, pork, poultry, sheep meat, milk, cheese, butter, skim milk powder, and whole milk powder. Projections comparable to the baseline that are used here, produced using information available early in 2002, are reported in Binfield, et al. (2002). The MTR proposes major changes to EU policies affecting the rice and rye sectors that could have important impacts on other commodity markets so the basic model has been expanded to incorporate these commodities. The new model components should be seen as provisional.

The changes that are proposed in the MTR communication would comprise a radical change in the policy environment faced by producers. The model used for the analysis was developed to replicate the structure of existing policy. The results of changing policy marginally, say a reduction in intervention prices, can be estimated with more confidence than a more radical reform, such as the decoupling of payments under the MTR. In order to increase confidence in the projections under such a scenario the results incorporate the feedback that has been provided by expert review of preliminary results. External evaluation is a central part of the FAPRI process.

### **3. Scenario assumptions**

The baseline assumes a continuation of current agricultural policies in the European Union and other countries. Therefore, the changes to the CAP in Agenda 2000 are incorporated, including the planned 2005-2007 expansion of milk quotas and reduction of dairy intervention prices. Neither the enlargement of the EU, or any changes that might arise from the World Trade Organisation are incorporated. It is also assumed that some scheme removing cow beef from human consumption continues to operate in the UK.

The baseline and scenario both assume world market conditions consistent with FAPRI projections. While the last FAPRI global baseline was prepared in January 2002 (FAPRI 2002a), an update for U.S. agricultural markets was prepared in June 2002 that incorporates effects of the 2002 U.S. Farm Security and Rural Investment Act (the 2002 U.S. farm bill). For this analysis, baseline world prices are consistent with those reported in the June 2002 study (FAPRI 2002b).

The baseline incorporates macroeconomic projections obtained from a variety of sources in mid 2002. The pace of economic growth is expected to pick up in 2003, with growth in real GDP averaging 2.6 percent per year between 2003 and 2009. Inflation is assumed to remain low, as the GDP deflator increases by less than 2 percent per year. The euro has strengthened considerably against the dollar in 2002, and further strengthening is

assumed for 2003 and 2004. The 2004 exchange rate of \$1.03/euro is assumed to persist in all subsequent years.

Assumptions for the **MTR** scenario are based on the communication from the Commission to the Council and the European Parliament, “Mid-Term Review of the Common Agricultural Policy.” The document does not comprise legislation and thus there is scope for different interpretations of some of the proposed changes. An important determinant of the outcome of any reform will be the conditions that are required in order for producers to claim the payment, as this will determine the degree of decoupling. In the MTR document, payments are conditional on meeting environmental and food safety standards, as well as maintaining land in good agricultural condition.

In the cereals sector the MTR proposes a further 5 percent cut in the intervention price, compensated for by an increase in the cereal payment from 63 euro/tonne to 66 euro/tonne. Intervention no longer operates in the rye sector. The durum wheat supplementary payment is cut to 250 euro/hectare. The oilseeds payment continues to equal that for cereals. Rotational set-aside is replaced with long-term set-aside, and the production of industrial and energy crops on set-aside is prohibited. For energy crops, the proposal provides aid of 45 euro/hectare, with a maximum guaranteed area of 1.5 million hectares. While energy crops are not modeled separately in the system, it is assumed that the effects of the prohibition of production on set-aside and the energy crop-specific subsidies will largely offset each other, leaving production of energy crops near baseline levels.

The rice intervention price is reduced from 298 euro/tonne to 120 euro/tonne, whilst the direct payment increases from 53 euro/tonne to 177 euro/tonne.

Cereal and oilseed compensatory payments, rice income payments, and the payments currently made in the beef and sheep sectors are decoupled from 2004 onward. Payments are provided in the form of a single farm payment. However, in the models it is assumed that the payments still retain some production-influencing effect. Specifically, it is assumed that the new payments will have 30 percent of the supply-inducing effect of the more-coupled payments they replace. This is broadly consistent with FAPRI’s treatment of U.S. farm program payments (for a discussion of decoupled payments in the US see Adams et al, 2001).

Starting in 2004, the new per-farm payments, the durum quality payment, and the rice specific crop payment are reduced by 3 percent a year to a maximum reduction of 20 percent (in 2010) for farms larger than a

certain size (dynamic modulation). Adjustments have been made in the individual countries on the basis of information provided by the Commission. Direct aids are capped at 300,000 euro per farm. It is assumed that both the money recouped from capping payments and from dynamic modulation does not return to the sector in a production-distorting manner.

In addition to assumptions regarding the macroeconomic and agricultural policy environment, it is also necessary consider the behavior of the Commission. The Commission has tools at its disposal which it can use to alter the market situation in many commodities. In particular, where prices rise the Commission may choose to save money by reducing subsidized exports. In the baseline and under the MTR scenario, therefore, exports of some commodities are below their maximums under the Uruguay Round Agreement on Agriculture, and this mirrors the experience of recent years. Different Commission behavior to that assumed here could result in significantly different price paths for many of the major commodities.

#### **4. Model results**

Decoupling payments from production represents a fundamental change in the support for agriculture in the EU. Over the history of the EU, support has evolved from a situation where price support and intervention predominated, to one where increasingly direct payments are used to support farmers. The importance of payments in the income of the farmer differs between sectors, as does the degree to which the payments are linked to production.

##### **4.1. The crop sector**

Existing direct payments in the EU cereals sector are more decoupled than those in other sectors. Producers are free to choose which of the main cereals crops to plant on their land. In addition to this, producers can decide to expand area that is not productive under the voluntary set-aside scheme. It is not surprising, therefore, that the overall impact of the MTR projected by the model is small for crops in general (Table 1). Relative to the baseline, total area planted to crops that are modeled are 2 percent lower in under the MTR. The overall figure, however, includes significant differences between crops. The MTR proposes the elimination of intervention for rye and a reduction in support for durum wheat production, and the area planted to these crops falls by 15.5 percent and 5 percent respectively.

**Table 1**

Changes in EU crops area, million hectares

	<b>2004</b>	<b>2004</b>		<b>2009</b>	<b>2009</b>	
	<b>Baseline</b>	<b>MTR</b>	<b>Change</b>	<b>Baseline</b>	<b>MTR</b>	<b>Change</b>
Soft wheat	13.69	13.68	-0.1%	14.09	14.18	0.7%
Barley	10.59	10.48	-1.1%	10.41	10.13	-2.7%
Maize	4.29	4.27	-0.5%	4.22	4.20	-0.4%
Durum	3.76	3.49	-7.2%	3.74	3.55	-5.0%
Rye	1.16	1.02	-12.4%	1.10	0.93	-15.5%
Rice	0.40	0.38	-3.3%	0.40	0.38	-3.4%
Oilseeds	5.63	5.37	-4.7%	5.57	5.36	-3.7%
9-crop area harv.	39.52	38.67	-2.1%	39.53	38.75	-2.0%

The changes in area harvested for the major cereals, however, are projected to be small. Soft wheat area actually rises in the projections, as EU wheat prices are closer to world prices than those for other commodities. Since barley prices are closer to intervention prices, they are affected more by the reduction in support prices under the MTR. Consequently, barley area falls and there is some substitution into wheat from these other cereals.

It is likely that when producers chose to reduce production of crops, this reduction will come from the less productive areas. The model captures this effect in that reductions in area result in a small increase in yields. Therefore, changes in area are partially offset by yield changes (full results are available from the authors).

Intervention stocks of cereals, which exist in the baseline for soft wheat, barley, rye, and rice, are reduced in the scenario as a consequence of the combination of intervention price reductions and lower production where applicable. In the case of rye and rice, stock levels fall dramatically as a result of the more drastic changes that are proposed for those regimes in the MTR.

The estimated impact of the MTR on crop prices is presented in Table 2. The results follow the pattern of the area changes that were discussed above. There are small changes in the prices of the major cereals. In the short run reductions in stock levels result in lower stocks and higher exports from the EU. This results in a

reduction in EU and world prices. In the longer run, exports for cereals, except wheat, are below baseline levels and this increases world prices.

**Table 2**

Change in prices under the MTR scenario compared to the baseline, percent

	2004	2005	2006	2007	2008	2009
EU soft wheat	-1.7	-0.7	0.2	0.3	0.5	0.5
U.S. wheat Gulf	-1.4	0.1	0.4	0.2	0.5	0.4
EU barley	-3.2	-2.8	-2.5	-2.0	-1.7	-0.5
U.S. barley Portland	0.7	1.4	2.1	2.5	2.6	2.1
EU maize	-0.5	-0.6	-0.2	0.2	0.4	0.8
U.S. maize Gulf	-0.2	-0.3	0.1	0.2	0.2	0.2
Hamburg rapeseed	3.8	0.7	1.5	1.6	2.3	2.2
Rhine sunflower	1.7	1.5	1.4	1.4	1.6	1.7
EU rye	-25.6	-20.1	-17.3	-13.6	-13.4	-8.7
EU rice	-31.2	-34.3	-31.6	-29.3	-28.3	-40.1

Of the major cereals, barley prices show the most significant changes. As has been noted above, barley prices are closer to intervention levels in the baseline than those of maize or wheat. In both the baseline and the scenario, barley exports are for the most part dependant on export subsidies. In the scenario, the drop in supplies results in a fall in exports, with the Commission assumed to operate export subsidies in such a way that EU prices fall relative to their baseline levels. Note that alternative assumptions regarding Commission behavior are possible here. For maize, however, the EU is a net importer of product, and therefore trade agreements largely constrain imports. The reduction in production of maize has a positive impact on prices, but this is offset by the effect of lower prices of other feed grains that increases competition.

For oilseeds, reduced EU production results in an increase in net imports and a modest increase in EU and world prices. World rapeseed and sunflower market effects are proportionally larger than those for soybeans, given relative EU shares of world production.

In the oilseeds sector, the reduction in production results in an increase in EU prices and subsequently an increase in net imports. The increase in net imports has a positive effect on world prices. The magnitude of the increase of world prices depends on the relative importance of the EU in the world trade of that particular commodity.

There are larger changes in the prices of the commodities where greater changes to support regimes are proposed. The rye sector under the baseline sees prices that remain at or below the intervention level. Ending intervention causes the market price to drop, which is exacerbated by the large amount of intervention stocks that build up prior to 2004 and are assumed to be gradually released on to the market. Over time the drop in area and the disposal of stocks allows the rye price to recover, but it does not reach its baseline levels. Similarly, rice prices fall with intervention price reductions. In the longer run there is no recovery in price, as the EBA agreement results in a significant increase in imports under both the baseline and the scenario. Changes in the durum sector reduce production and increase prices.

#### **4.5. Livestock production**

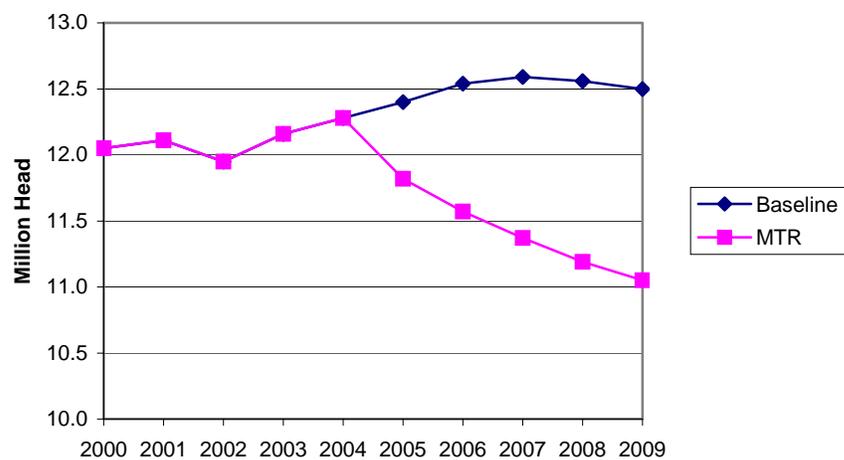
Direct payments have become increasingly important in the support of the livestock sector under the CAP as reforms have been implemented. These payments are typically paid per head of animal and, therefore, it is usually necessary to have the animal (and therefore produce meat) in order to receive the payment. As these payments have increased, they have become more important in the margins, and the decision making process, of the producers. In some cases these payments account for more than 100 percent of producers' income. Decoupling these payments, therefore, is likely to have significant implications for many producers. These impacts will differ across production systems and regions. Although some farm level analysis was carried out, inevitably more work in this area is needed to clarify this intricate problem.

In the beef sector payments were introduced in the 1980s and were increased in both the MacSharry reforms in 1992 and under Agenda 2000. Payments are mainly made on suckler (beef) cows and male animals. These payments are restricted by quotas. In some regions, producers are heavily reliant on these payments, in others, production of beef occurs outside of quota, or otherwise without claiming premia where the conditions for getting these premia are not met.

It is likely, therefore, that the decoupling of payments will reduce animal numbers for producers who are relatively dependant on these payments, whilst more efficient producers, and those with greater market

orientation, could well expand animal numbers. The regional effects of the policy change are likely to be considerable but beyond the scope of this analysis.

The models can be considered as giving approximate aggregate estimates of these effects. Given the way that support is organized in the EU, the largest impact of decoupling in the beef sector will be in suckler cows. Not only is the suckler cow payment decoupled, but the decoupling of other payments in the sector will reduce calf and store animal prices, further impacting on the returns of the suckler enterprise. Suckler cow numbers fall in the MTR scenario by approximately 5 percent in 2004, growing to almost 12 percent by 2009 (Figure 1). Dairy cow numbers remain essentially unchanged, as it is assumed that the quota will continue to be the overwhelming factor driving milk production and cow numbers, even if payments are decoupled.



**Figure 1. Suckler cow numbers in the EU under the baseline and in the MTR scenario**

In the short run, the fall in suckler numbers is achieved partly through the liquidation of herds, and there is therefore an increase in beef production that depresses prices in the early years post 2004. Over time, the reduction in herd size reduces the number of calves produced by the sector. Slaughterings, and therefore beef production, fall and in the longer run this effect predominates, pushing up the price of beef in the longer run.

Currently, the sheep sector is also supported by payments made on a per head basis, and this is paid on ewes. The impact of decoupling in this sector is therefore similar to that in the beef sector with a short run increase in production as the breeding herd is reduced, followed by a fall in supplies and a positive impact on prices. Unlike in the beef sector where the dairy sector is unaffected and still provides similar number of calves, all the drop in ewe numbers is reflected in production. By 2009, sheep meat production in the MTR scenario is almost 5 percent below baseline levels.

The estimated effects of the scenario on EU livestock prices are shown in Table 3. By 2009, EU cattle prices exceed baseline levels by about 8 percent, and EU sheep prices exceed baseline levels by almost 12 percent. The increases in prices that are brought about by the reduction in production in the longer term reduce the consumption of beef and sheep meat. The EU is a net exporter of beef, although under the baseline the vast majority of beef that is exported requires export refunds. An increase in EU price relative to the world price would be expected to result in a fall in exports, but in this case the behavior of the Commission is central. In this analysis the Commission is assumed to act in such a way to keep approximate expenditure on export refunds constant. In contrast, the EU is a net importer of sheep meat, and these imports are tightly controlled by quotas. Changes in production, therefore, must be determined largely internally and the sheep meat price rises higher than in the case of beef.

**Table 3**

Changes in EU livestock prices for MTR scenario in relation to baseline

	2004	2005	2006	2007	2008	2009
EU cattle reference	-3.2	-1.4	1.0	3.0	5.2	8.1
EU pork reference	-1.2	-0.1	0.6	0.4	0.5	1.0
EU chicken	-1.1	-0.3	0.3	0.4	0.7	1.1
EU sheep reference	-7.7	4.0	12.9	12.4	11.0	11.7

With little change in feed prices, estimated changes in the pork and poultry sectors can be explained by changes in the beef and sheep meat sectors. Initial lower prices for beef and sheep meat result in reduced prices and production for pork and poultry. In the longer run, however, higher beef and sheep meat prices encourage increased consumption of pork and poultry, resulting in marginal increases relative to the baseline in both prices and production levels for pork and poultry.

## 5. Concluding comments

In this paper a partial equilibrium model has been used to estimate the impact of adoption of the European Commission's proposals in the MTR communication. These proposals include a radical reform of the way that agriculture is supported in the EU, by replacing the current eclectic mix of direct payments with a

largely unified, single farm, payment. The decoupling of payments would significantly alter the economic decision making of producers. The MTR is estimated to result in reduced EU production of most major agricultural commodities in the EU. The magnitude of the change in commodity production depends on the degree to which the current payments are coupled, and the relative reliance of producers on these payments. Thus the decoupling provisions will have a greater effect on the livestock sectors, in comparison to the cereals sector.

The proposals also include other policy changes that will have an impact on markets. There are reductions in the intervention prices of the major cereals. Also, large changes in the way that “problem” commodities such as rye and rice are supported result in dramatic shifts in the price and stock levels of these commodities.

In the medium and long term, the reductions in production in many commodities, and the associated price changes result in a reduction of EU agricultural exports and/or an increase in imports. The result of these changes is small changes in world prices for these commodities. The magnitude of the impact on world prices depends on the extent of the policy changes and subsequent production response, price levels relative to intervention where appropriate, and the degree to which EU markets are isolated from world markets.

The analysis depends on a series of assumptions about how markets are likely to evolve, how policies would be implemented, and how economic actors would respond to changed incentives. The actual outcomes should such a policy be enacted could be very different from those projected here.

### **Epilogue.**

Since this analysis has been carried out the European Commission released legislative proposals based on the MTR, and there has been agreement on CAP reform in Luxembourg in June 2003. An analysis of the legislative proposals was carried out under the auspices of the FAPRI-Ireland Partnership and this is available at [www.tnet.teagasc.ie/fapri/](http://www.tnet.teagasc.ie/fapri/). As the legislative proposals were essentially very similar to the MTR proposals the results resemble those that are presented in this paper. The final agreement, however, watered down many of the proposals and individual countries have discretion over the degree of decoupling that they implement. An analysis of these reforms would therefore have different results than those above.

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