

REFEREED PAPER

**POTENTIAL IMPACT OF CAP REFORM POST 2013
ON THE CEREAL AND LIVESTOCK SECTORS: AN
IRISH CASE STUDY**

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Using a dynamic, multi product partial equilibrium model, this paper examines the potential impact of changes to the CAP on farmers' behaviour. The results highlight how recent policy changes under the MTR (such as the move towards decoupling) as well as further likely reforms post 2013, such as an increase in the rate of modulation and the introduction of a common flat area payment across member states, will lead to significant changes in agricultural activity.

Key words: Common Agricultural Policy; agricultural production; decoupling; modulation

Introduction

Since the MacSharry reforms of 1992 the EU has moved from a policy of price support towards measures that are decoupled from production. The most significant move in this regard was the Mid Term Review (MTR) of the Common Agricultural Policy (CAP) in 2003 where member states agreed to implement a system of payments which were not related to actual production. Decoupled payments were defined in the Uruguay Round Agreement on Agriculture (URAA) as payments that are financed by taxpayers rather than by consumers, are not related to current production, factor use or prices and for which the eligibility criteria are defined by a fixed historical base period, whereby actual production is not needed to receive payments. Decoupled payments were introduced in order to curb over-production and to reduce the trade-distorting and inefficiency effects of the CAP (Falconer and Ward, 2000; Swinbank and Daugbjerg, 2006). Under the new system, the majority of payments to farmers in Ireland will be paid independently of the volume of production.

While the most significant reform under the MTR was the decoupling of direct payments, one further important policy change was the move towards making modulation compulsory for all member states. Modulation refers to the transfer of payments from the first pillar of the CAP (market measures) to the second pillar of the CAP (rural development policy). As a result of the MTR, member states are required to reduce the level of direct payments in excess of €5,000 to farmers by 3 percent in 2005, 4 percent in 2006 and 5 percent thereafter and transfer these funds towards the second pillar. Under the second pillar resources are being targeted towards measures addressing the multifunctional agenda of farming activity. In particular, the Rural Development Regulation (RDR) measures aim to "help European farmers take up their multifunctional role as custodians of the countryside (EC, 2004; p.6).

In addition to providing us with food and other raw materials necessary for our survival and maintaining economic activity in rural areas (Kelch and

Normile, 2004), farming activity has environmental (Firbank, 2005; Cocklin et al, 2006; MacMillan et al. 2004), aesthetic (Vanslebrouck et al., 2005) and social functions (Gerowitt *et al*, 2003). The term ‘multifunctionality’ has been widely used to conceptualise these wider external effects of the agricultural sector. Furthermore, through cross-compliance obligations, even eligibility for the main direct payments is now conditional on achieving environmental and welfare goals.

The MTR of the CAP sets out the budgetary framework until 2013 but the European Commission has signalled that further reform is likely at the end of this period. Two of the most likely policy changes in any future CAP include increases in the rate of modulation and measures designed at promoting a more equitable distribution of payments across member states. Currently the rate of modulation is set at 5 per cent of direct payments over €5,000 and given its limited budget its overall effect is limited. Under the MTR of the CAP in 2003 the EU upgraded the status of non-agricultural objectives from ‘optional extra’ to ‘intrinsic component’ and presented a broad range of multifunctional elements as key ingredients of the future direction of agricultural policy. The increase in the rate of compulsory modulation agreed in the CAP Health Check and the ensuing resources raised will in part be used to help fund measures aimed at promoting the multifunctionality aspect of agricultural activity.

In relation to the distribution of payments, there has been widespread criticism of the imbalance of payments between farms and across countries. Decoupled payments are based on previous payment receipts and therefore the system is still open to the criticism that the largest and most affluent farmers are the main beneficiaries (Pelkmans, 2006). For example, farmers, all things being equal, in new member state countries (those who joined the EU in 2004) receive a lower payment per hectare than those in the EU-15. As Bureau and Mahé (2008) report, the political legitimacy of these differences in payments is no longer justifiable as the current distribution of CAP payments across member states do not contribute to the European Unions cohesion objectives.

Given the significant and wide-ranging effects of farming activity on the agricultural sector and on society more generally, and the budgetary resources devoted to agriculture within the EU, it is important that the effect of policy changes on agricultural activity be assessed. In this regard, using Ireland as a case study the overall aim of this analysis was to evaluate the potential changes in the livestock and cereal sectors accruing from changes to the CAP. More specifically, using a dynamic, multi product partial equilibrium model this paper examines the potential effect of recent changes to the CAP under the MTR in 2003 on the livestock and cereal sectors.¹ In addition, the potential effect of two of the most likely avenues for further reform, namely increases in the rate of modulation and the move towards equalising the level of payments across member states are also examined. Firstly, this paper provides a

1. It was beyond the scope of this paper to discuss the dairy sector which is the other major agricultural sector in Ireland. The dairy sector faces a fundamental policy change in the form of EU milk quota elimination. This complicates the analysis of the impact of CAP reform on the dairy sector and means that a concise discussion of the impact is not possible in this paper. For more details on the potential impact of milk quota reform see http://www.tnet.teagasc.ie/fapri/downloads/pubs2007/outlook2007/FAPRI-IE_2007_Aggregate_Baseline.pdf

description of the research design which is followed with a discussion of the empirical results. Finally, this paper concludes with a discussion of its main findings and their implications for the agricultural sector.

Research Design

The modelling approach used in this analysis was the development of an econometric, dynamic, multi-product partial equilibrium model (AGMEMOD). AGMEMOD is funded under the European Commission 6th Framework and by contributions from the partners' institutes throughout the EU. The AGMEMOD Partnership model is an econometric, dynamic, multi-product partial equilibrium model and involves institutes in the EU15 group of member states. In advance of the accession of the so-called "new" member states in May 2004 the AGMEMOD partnership was expanded in 2002 to include research institutes from 8 of the 10 new EU member states. Based on a common country model template, country level models have been developed that reflect the specific situation of the agricultural sectors in individual EU member state countries. In all country models, agricultural supply and use data as well as policy data for the years 1973-2005 have been collected for all countries with the exception of Cyprus, Malta and Luxembourg and the two newest members, namely Romania and Bulgaria who joined in 2007. Problems with data availability have meant that these countries have been excluded from the analysis.

For each commodity modelled, and in each country, agricultural production as well as supply, demand, trade, stocks and domestic prices are derived by econometrically estimated equations. Projections of exogenous data relating to macroeconomic series such as exchange rates and GDP taken from research institutions within each individual member state have been incorporated into the model. In addition, projections of world prices from the Food and Agricultural Policy Research Institute (FAPRI) have been incorporated into the model structure. The national level models have then been combined into a composite EU model. The final dynamic, multi-market, multi-country composite model developed allows us to generate projections for each member state, under the assumption of exogenous world prices (for a more detailed description of the model structure the reader is referred to Chantreuil *et al.*, 2005).

In order to analyse the impact of policy reform, data on all of the different types of direct payments that are and were part of the CAP, were collected for each member state. This was used to create a database which in a coherent manner across all the member states incorporated the total budgetary envelopes, the different types of the EU CAP direct support elements, and their allocation from the total budgetary envelopes. The degree to which decoupled payments are expected to impact production decisions is captured via explicit coefficients that are termed multipliers. Using these multipliers and the various policy data a set of country specific variables were developed which calculated the impact of policy instruments on the supply and use of various agricultural commodities. In particular, in the case of Ireland reaction prices for beef and sheep meat and an adjusted gross return figure for grains

were calculated. These variables were then included in the estimated equations in the model. For example, in the case of beef it is assumed that the incentive price faced by farmers is the real cattle or beef price plus the beef reaction price. The reaction price varies according to the degree to which the decoupled payments of relevance to the beef sector are assumed to have a supply inducing effect.

Decoupled payments are in the World Trade Organisations (WTO) 'green box' of agriculture related subsidies and thus must adhere to the fundamental requirement that the policy has no, or at most minimal, trade-distorting effects. There is considerable uncertainty, however, as to whether these payments are indeed production neutral (see Adams *et al.*, 2001; Colman and Harvey, 2004; Goodwin and Mishra, 2005; Hennessy and Thorne, 2005; Howley *et al.*, 2009). The two most extreme viewpoints relating to the impact of decoupled payments are that firstly they will maintain the same supply inducing impact of previously coupled payments or secondly they will have a zero impact on production behaviour. For the purposes of this paper it is assumed that decoupled payments will have an impact in between these two values. More precisely, across all country models within the EU-15 multipliers are given a value of .5 which means decoupled payments are assumed to have 50 percent of the supply inducing impact of previously coupled payments. The true impact of decoupled payments may differ from this point and in any case the actual effect is likely to deviate across farm systems and regions. That said, it is felt that this serves as a reasonable approximation of the supply inducing impact of decoupled payments and enables projections of supply, demand and prices of various agricultural commodities as far as 2020.

In the following section results from a baseline analysis whereby the policies implemented under the MTR are projected to remain in place until 2020 are presented. These baseline figures are then compared with the results of three policy scenarios. The first policy scenario examined the potential impact of the recent Health Check proposals by the Commission. Two further policy scenarios examined the effect of two of the most likely policy changes in any future CAP, namely increases in the rate of modulation and the introduction of a common flat rate payment per hectare across all member states.

Results

With decoupling of direct payments and the enlargement of the EU to incorporate Central and Eastern European Countries (CEEC), market signals will play a more important role in EU agriculture. The following section is concerned with analysing the effect of these recent changes. In this analysis, the decoupling decision made by member states in 2005 cannot be changed. The current mix of historic, static and dynamic regional models and hybrid models will continue for the complete projection period to 2020. The CAP budget and national ceilings remain at the levels as set out in Regulation EC 1782/2003. In Ireland all premiums have been fully decoupled from production since 2005. While in Ireland there are no explicit agricultural

policies that encourage the production of crops for use in the production of biofuels (bioethanol and biodiesel) there exists an EU target that 10% of transport fuels be from renewable sources by 2020 [Directive 2003/30/EC of the European Parliament and the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport (OJ L 123, 17.5.2003, p. 42).]. In this analysis it is assumed that the EU target of 10% biofuel share of transport fuels will be met by 2020, with these targets transformed to equivalent tonnages of cereal and oilseed feedstocks (see von Ledebur *et al.*, 2008). Over the projection period, increased biofuel demand for cereals contributes to the relatively buoyant price outlook for such commodities. Biofuel policies in other countries, such as the United States, are reflected in the world price projections for oilseed and cereal crops (FAPRI, 2007) that are taken as exogenously determined. The model projections in 2020 are compared with 2005 as this was the last year in which agricultural supply and use data were collected for all member states and also the year in which the move towards decoupled payments in Ireland was fully implemented.

Baseline

Grains

In relation to grains, there are projected price increases in the prices of the three major grains grown in Ireland, namely soft wheat, barley and oats between 2005 and 2020 which is largely driven by projected increases in biofuel demand in the EU. As a result, under the Baseline scenario, the area devoted to the production of grains in Ireland is projected to increase by 11 percent over the projection period (see table 1). The total production of grains is projected to increase by 33 percent over the projection period. This increase is driven by the combination of increases in the yields of the major grains grown in Ireland (soft wheat, barley and oats) and increased area harvested. Overall grain feed use is projected to decline from 2,295,000 tonnes to 1,884,000 tonnes between 2005 and 2020 (18% drop). This decline is attributable to a projected decline in overall meat production, which reduces the derived demand for grains as an animal feed, and a projected increase in the price of grains between 2005 and 2020. The significant increase in the production of grains coupled with falling domestic use results in imports of grains that decline by 37 percent and exports of grain that are projected to increase by 97 percent between 2005 and 2020. The overall result being that Ireland is projected to become a net exporter of grains (49,000 tonnes)

Table 1: Baseline analysis: grains

		2005	2020	Total percentage change
Total grains				
Production	1,000 ton	2123	2832	33.4
Area harvested	1,000 ha	281	312	11.2
Domestic Use	1,000 ton	3089	2699	-12.6

whereas at the start of the projection period in 2005 Ireland was a net importer of grains (717,000 tonnes).

Livestock markets

Cattle: Under the Baseline scenario, despite projected increases in nominal cattle prices the Irish suckler cow herd is projected to decline by 25 percent between 2005 and 2020 (see table 2). This is a continuation of the trend evident post decoupling as the Irish suckler cow herd declined by 3 percent between 2005 and 2007. The Irish Dairy Cow Herd is projected to decline by 13 percent over the projection period. This decrease is due to an increase in milk yields as the milk quota is fixed at 2008/2009 levels for the Baseline analysis. Due to the projected declines in the Irish suckler and dairy cow herds, total cattle ending numbers, cattle slaughter and the calf crop are projected to decline by 30, 21 and 19 percent respectively over the period 2005-2020. Due to a fall in total cattle slaughter Irish beef production is projected to decline by 28 percent over the projection period. As a result of falling indigenous production, exports of beef are projected to decline by 35 percent over the period 2005-2020.

Sheep: Under the Baseline scenario the ending stocks of ewes are projected to decline by 42 percent over the projection period, despite nominal prices of lamb that are projected to increase strongly. The most recent data indicate that between 2005 and 2008 the Irish ewe flock has contracted by almost 22 percent. With lower numbers of lambs produced each year the projected volume of lamb and other sheep slaughtering is projected to decrease over the projection period, with slaughtering of sheep in 2020 46 percent lower than in 2005. The reduction in numbers of sheep slaughtered means that sheep meat production is projected to decline by 40 percent between 2005 and 2020. With production projected to fall, Irish exports of sheep meat are projected to decline by approximately 60 percent over the Baseline projection period.

Pork: Under the Baseline scenario, the total number of sows is projected to decline by 12 percent over the period 2005 to 2020. This decline is largely due to feed costs and the increased costs of compliance with environmental regulations which have since the late 1990s caused the Irish sow herd to contract. The projected decline in sow numbers results in the Irish pig crop declining by 11 percent. The fall in the number of pigs produced over the projection period results in the total number of pigs slaughtered contracting by 6 percent over the projection period. The decline in the number of pigs slaughtered means that Irish pig meat production is projected to decrease by 9 percent over the projection period.

The results presented in this baseline analysis suggest that if policies enacted under the MTR are to remain in place then there could be significant changes in the Irish grain and livestock sectors. For example, the number of suckler cows, ewes and sows are projected to decrease by 18, 42 and 12

percent respectively over the projection period. The more pronounced decline in the number of ewes relative to suckler cows is due to the fact that in addition to the effect of decoupling, the number of ewes has been declining since the introduction of cross compliance obligations in 1998 designed to reduce the number of ewes in environmentally sensitive areas. Given that the CAP has little direct impact on the pig sector the decline in the number of sows is largely due to increased feed costs and the increased costs of compliance with environmental regulations which have since the late 1990s caused the Irish sow herd to contract. The projected decline in the number of breeding animals (suckler cows, ewes and sows) results in beef, sheep and pig meat production falling by 28, 40 and 9 percent respectively by 2020 relative to 2005. In relation to grains, while the move towards decoupled payments reduces the incentive for farmers to harvest grains, this is not enough to offset the increased demand for grains driven by a large projected increase in biofuel

Table 2: Baseline analysis: Livestock and meat products

		2005	2020	Total percentage change
Beef and veal				
Production	1,000 ton	545.9	393.2	-28.0
Beef cows ending stock	1,000 head	1150	856	25
Domestic Use	1,000 ton	89.9	116.8	29.9
Price	Euro/100kg	136.4	171.9	26.0
Sheep meat				
Production	1,000 ton	73.3	43.7	-40.3
Ewes ending stock	1,000 head	3208.6	1849.8	-42.3
Domestic use	1,000 ton	18.3	24.3	32.9
Price	Euro/100kg	152.6	204.0	33.7
Pig meat				
Production	1,000 ton	205.2	186.9	-9
Sows ending stock	1,000 head	174.4	153.3	-12.1
Domestic Use	1,000 ton	150.0	184.0	22.7
Price	Euro/100kg	130.9	187.3	45.7

demand within the EU. The overall result being that there is a projected increase in the price of grains which results in an increasing share of land being devoted to grain production (11% increase).

Scenario analysis

Health Check

As part of the MTR of the CAP in 2003 member states agreed to a review of the reforms and to introduce modifications for the period 2009-2012. Proposals for the Health Check were published by the Commission on the 20th May 2008. The Health Check is not, however, designed to result in major changes to the CAP but rather it is supposed to “streamline and modernise” its operation. The main elements of the Health Check include:

- Full decoupling of the Beef Special premium and Slaughter Premium from 2012 onwards. Member states retain the option to maintain the partial coupling of payments for the suckler cow, sheep and goat sectors.
- Additional compulsory modulation implemented across member states
- Allowing member states who currently base their payments on historical entitlements (e.g. Ireland) to move towards a flat rate regional system.
- The gradual phasing out of milk quotas by raising quotas 1 per cent per annum between 2009 and 2013, followed by their complete elimination in 2015
- Expanding cross compliance obligations.

In terms of what these reforms might mean for the Irish livestock and cereal sectors, these changes do not fundamentally alter the nature of the CAP and so any subsequent impacts on agriculture are likely to be minimal (see Moss *et al.*, 2008). In the case of Ireland all payments are already fully decoupled and therefore the requirement to fully decouple the Beef Special Premium and Slaughter Premium will have little direct impact, save for any minor changes in trade accruing from different production levels in other member state countries. In addition, while the Health Check allows member states currently using a payment system based on historical entitlements to move towards a flat rate regional system, Ireland has chosen not to do so. Finally the increase in the rate of modulation would be expected to have some modest market effects as this reduces the Single Farm Payment (SFP) available for farmers. Nevertheless the transfer of funds from the first pillar of the CAP towards the second pillar is still relatively modest under the Health Check and therefore should not result in any significant changes in agricultural activity.

Increased modulation rate

As discussed earlier, there is significant pressure to reduce the amount of payments under the first pillar of the CAP and transfer these towards non-pillar 1 agricultural funding i.e. rural development measures under the second pillar. While food security² was the dominant concern for consumers at the onset of the CAP, wider external effects of agriculture relating to impacts on human health and the environment are now just as important to citizens of the EU (Burrell, 2004). These external effects of agriculture include impacts on: biological diversity, soil and water quality, landscape and habitats, rural tourism and the vitality of rural communities (Burrell, 2004; Moreddu *et al.*, 2004; Firbank, 2005; Boel, 2005) and can be thought of as public goods and often go unrewarded in the market place.

2. Food security is currently a key buzzword in policy circles as a result of two influential reports in the UK (Chatham House, 2009; Smiths Institute, 2009). In these reports it is outlined that the global food system will come under renewed pressure as a result of, among other things, population growth, the nutrition transition, energy, land, water, labour and climate change.

The SFP under the first pillar of the CAP does not support the provision of these public goods as it does not provide any positive incentives for the protection of the environment or for wider rural development. The effect of modulation has been limited given the modest transfer of funds from the first pillar to the second pillar of the CAP. The CAP Health Check agreement will, by increasing the rate of compulsory modulation, give rise to increased resources for the second pillar of the CAP that could be used to support rural development and environmental objectives. This movement of resources from direct income support to farmers to targeted support for the provision of environmental goods may characterise the CAP post 2013 (Bureau and Mahé, 2008).

Direct support payments in excess of €5,000 are modulated at the rate of 5 percent under the Baseline analysis. In this scenario the effect of increasing the rate of modulation in a linear fashion from 5 to 17 percent between 2013 and 2020 on the production of grains and meat products is analysed. Such a policy scenario would reduce the SFP for farmers and thus it would be expected, *a priori*, to have a negative effect on farm production. The impact of this policy change, as well as the introduction of an EU common flat rate payment per hectare discussed next, is inferred as the difference between the model's projections under the particular scenario and the Baseline run. As can be seen in table 3 the increase in the rate of modulation results in a projected decline of 8 percent in grain production, 10 percent in beef production and 11 percent in sheep meat production in 2020 relative to the baseline. This policy scenario is projected to have little direct impact on the pork sector so as expected this policy does not result in any significant projected changes in pork production over the projection period (0.5% drop).

EU Flat rate

The policy of price support evident in the EU agricultural sector prior to the introduction of decoupled payments established a pattern of transfers that favoured larger farms (Ackrill, 2008). Furthermore, not only is a disproportionate amount of payments being accrued by the largest farmers there is also an inequitable distribution of payments between member states. One of the central issues in the design of any new CAP is likely to be measures aimed at addressing this imbalance in payments. For example, in the explanatory memorandum accompanying the Commission's Health Check proposals (CEC, 2008; p. 18) the Commission argues that it is "increasingly harder to justify the legitimacy of significant individual differences in support level which are only based on past support." This fact has led to suggestions that an EU wide flat rate payment should be introduced instead of the historic and regional payment models in place currently.

In this policy scenario the effect of a common EU wide flat rate payment per hectare calculated as the sum of the currently agreed national budgetary envelopes in 2005 divided by utilisable agricultural area in the EU-27 being implemented (€247/hectare) is analysed. Such an approach if adopted would result in a significant fall in the level of support given to Irish farmers with a

consequent increase in the level of support given to farmers in, for instance, new member state countries. For example, in the case of Ireland such a policy if implemented would result in the average per hectare payment falling to a figure of €247 per hectare from a figure of €311. Consequently, the, *a priori*,

Table 3: Scenario analysis

	Baseline	EU Flat rate	Modulation
Grain production 1,000 ha	2832	2576 (-9%)	2608 (-8%)
Beef Production 1,000 ton	394	354 (-10%)	355 (-10%)
Pig meat production 1,000 ton	187	186 (-.5%)	186 (-.5%)
Sheep meat production 1,000 ton	44	39 (-11%)	39 (-11%)

expectation here would be that this policy scenario would have a negative effect on agricultural activity in Ireland. As can be seen in table 3, if this policy were to be implemented in 2013, grain, beef and sheep meat production is projected to fall by 9%, 10% and 11% by 2020 relative to the baseline.

Discussion

European agricultural policy underwent significant changes under the MTR of the (CAP) in 2003 where with some exceptions, member states agreed to implement a system of SFP's which were decoupled from production. WTO concerns were central to shaping the 2003 reforms as it was felt decoupled payments reduce the trade distorting and inefficiency effects of the CAP. Under this new system, farmers in Ireland are paid a lump-sum cash payment based on historical payments, whereby actual production is not needed to receive support. One further significant policy change was making modulation compulsory for all member states. These reforms sought to address the problem of overproduction evident in the EU since the 1980s, as well as help farm activity move to meet wider demands from society with respect to the environment, food quality and safety and wider rural development. This analysis has shown how the Irish livestock and cereal sectors is set to undergo significant changes if current policies remain in place. In particular, the move towards decoupling of payments reduces the incentive for farmers to produce with the result that there is a significant projected decline of 18 and 42 percent respectively in beef and sheep meat production between 2005 and 2020. Pork production is projected to decline by 9 per cent over the projection period. Given that the CAP has little direct impact on the pig sector this decline is largely due to increased feed costs and the increased costs of compliance with environmental regulations.

It has been reported that the anticipated reduction in livestock numbers as a result of decoupling may lead to land abandonment (Oglethorpe, 2005; Kantelhardt 2006). Through cross compliance obligations, however, farmers are required to keep their land in good agricultural and environmental condition. In any case, while decoupling is expected to lead to a reduction in livestock numbers the projected decline should not be significant enough to lead to any

drastic changes in land use such as land abandonment. In relation to cereals the move towards decoupled payments is not enough to offset the increased demand for grains as a result of a projected increase in biofuel demand within the EU. The result being that there is a projected 11 percent increase in the area devoted to the production of grains between 2005 and 2020.

The Health Check agreement on November 2008 led to some changes to the CAP agreed in 2003. The principal changes were to extend further the set of direct payments that must be decoupled from production, increase the rate of compulsory modulation and agree that the current milk production quota system will end in 2015 and that in advance a series of 5 annual increases in milk quota will occur. In this paper it is assumed that the milk quota system remains unchanged over the projection horizon, and the impact of changes to modulation and direct payments that could arise from future reforms of the CAP is analysed.

Given that all direct payments in Ireland were already fully decoupled since 2005 the impact of the Health Check is likely to be relatively minor. Further more significant reforms are expected to be introduced at the end of the current financial perspective in 2013. Up until the reforms introduced in 2003 the CAP was synonymous with overproduction and environmental degradation. The problem with over production has been at least partly solved by severing the fifty year link between payments and production with the introduction of decoupled payments. There is considerable uncertainty, however, as to whether farmers are treating these payments as fully decoupled. It is frequently argued, for instance, that decoupled payments increase overall wealth and that this increase in wealth can facilitate on farm investment, the provision of loans from lenders or even decrease a farmer's risk aversion making them more likely to engage in production activities that without these decoupled payments they may not have made (Bhaskar and Beghin, 2009). Secondly, the variety of non-market based benefits to farming mean that decoupled payments could potentially alter the supply of agricultural commodities by allowing those who enjoy farming irrespective of any financial reward to continue in farming. Nevertheless, as Howley *et al.* (2010) assert, while decoupled payments appear to still have a positive impact on agricultural production this effect is less than what would be observed if these payments were still fully coupled.

In relation to environmental degradation the European Community's Fifth Environmental Action Programme concluded that "farming practices in many regions of the community have led to over-exploitation and degradation of the natural resources on which agriculture itself ultimately depends: soil, water and air" (European Commission, 1992; p.15). The CAP in recent times has shifted in part to address these concerns by increasing the resources available to its second pillar. That said, the amount of funds available under the second pillar is still modest and consequently its overall effect is limited. It seems likely that any future formulation of the CAP will shift a much greater proportion of payments under the first pillar to measures aimed at enhancing the environment and wider rural economy under the second pillar. As demonstrated in this paper even a modest increase in modulation to 17 per cent

by 2020 could significantly reduce the production of grains, beef and sheep meat. One further scenario examined in this analysis was the move towards a flat rate payment per hectare across all member states. Even if the overall CAP budget was held constant such an approach would lead to a significant redistribution of resources. Generally old member state countries with the exception of Spain and Portugal benefit disproportionately from the current system as they enjoy a much higher average payment per hectare than new member state countries. This paper demonstrated that if a common flat area payment per hectare across all member states was implemented then the SFP available to Irish farmers would fall significantly and agricultural production in the grain and livestock sectors would, in turn, diminish.

Analysing the impact of agricultural policy changes at the farm or market levels using economic models, such as the AGMEMOD model, provides important insights into the effects of policies. However, the projections produced in this paper are conditional in that they depend on data used on the future evolution of the wider economy (economic growth rates, inflation and currency exchange rates), on assumptions relating to the wider set of policies that affect agriculture (WTO, agricultural policy in non-EU countries) and on the degree to which our assumptions relating to the supply inducing impact of decoupled direct payments reflect the behaviour of Irish and EU farmers. Large shocks to the wider macroeconomy and/or unforeseen changes in agricultural and other policies will affect agriculture and will *ex post* be “missed” by this analysis. Changes in agricultural policy that have been agreed, such as the ending of the EU milk quota in 2015 if incorporated in our baseline policy assumptions alter our baseline projections from those presented here. However, given that such a policy change would also be incorporated in the various alternative policy scenarios analysed in this paper such a change is unlikely to significantly alter our analysis.

While this paper examined the impact of some potential changes accruing from a reformulation of the CAP budget there is also increasing demands that the CAP budget be significantly reduced. This demand centres on the cost of the CAP to the European tax payer as the CAP accounts for 40 per cent of the EU budget although agriculture represents only 4.2 percent of employment and 1.7 percent of GDP (Burrell, 2004). The European Commission has signalled that the share of the EU budget devoted to CAP will be reduced in further rounds of the CAP as it looks to focus resources on other issues such as climate change, global security, energy and the Lisbon Agenda. Furthermore, there is ever increasing pressure from other agricultural exporters placed on the EU to reduce what they see as highly protectionist and market-distorting agricultural policies. While recent World trade negotiations have stalled they look set to continue in 2010 and will continue to be highly influential in determining the future direction the CAP. Certainly it seems highly probable that large tariff cuts will be implemented across supported sectors within the EU at the conclusion of the next round of WTO negotiations (see Binfield et al., 2008 for an analysis of the potential impact of WTO reform).

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Acknowledgements

The authors thank the editor and three anonymous reviewers for their comments which significantly improved this paper. The authors acknowledge the work of their AGMEMOD Partners in the development of the AGMEMOD model used in this article. This research was supported by the 5th Framework Project QLK5-CT-2000-00473 and 6th Framework Project SSPE-CT-2005-021543.

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