

End of Project Report

Policy Changes in the Crops Sector and Projections for Incomes and Costs in Agriculture

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Summary

The research conducted under the projects 4821 and 4823 represents a continuation of project 4345, which has developed economic models of the Irish crops sector, agricultural inputs and incomes. These models are integrated within the FAPRI-Ireland model of the agricultural sector which is a joint undertaking between the Food and Agricultural Policy Research Institute (FAPRI)¹ and Teagasc. The crops model links to other Irish commodity models and an Irish inputs model to generate an income figure for Irish agriculture which is then projected forward on a 10 year basis.

In this research, the models were used to produce projections for the Irish crop sector, inputs and incomes for the period 2000-2010. These projections were generated under three policy scenarios. First, the models were run assuming that agricultural policy would remain unchanged throughout the projection period. Subsequently, these “baseline” projections were compared with projections generated assuming alternative policy scenarios. In 2001, the baseline was compared with the policy scenario of reduced or eliminated export subsidies. This scenario was designed to reflect possible changes in trade policy resulting from the World Trade Organisation (WTO) Millennium Round negotiations. In 2002, the baseline projections (now modified to include the policy changes that occurred in 2001) were compared with projections under a policy scenario which included further extensification of livestock production. This scenario was designed as a second guess to the policy reform proposals under the Mid-Term review (MTR) of the EU Common Agricultural Policy (CAP), which became available in July 2002².

Objectives

The general objective is to generate projections for the Irish:

1. crop sector
2. agricultural inputs
3. agricultural incomes.

The projections are generated under the existing policy framework as well as under alternative policy scenarios. Subsequently, the quantitative effect of each scenario is then gauged.

Methodology

The crops, inputs and incomes models are components of the FAPRI-Ireland modelling system developed to generate projections and conduct policy analysis for the Irish agricultural sector. The modelling framework consists of a system of econometrically estimated equations and linkages between agricultural variables across commodity sectors. Through the collaboration with FAPRI, models are

¹ FAPRI is based at University of Missouri, USA.

² The MTR proposals were not yet available at the time when the analyses summarised here was conducted.

also linked with their EU and world agricultural models. Therefore, in generating projections the following is ensured:

- the projections of agricultural outputs in Ireland are generated taking formal account of international market developments, and
- the most relevant policy levers associated with the CAP are fully incorporated within the projections.

Key findings

In 2001, the projections for Irish crops, inputs and incomes were generated under two policy scenarios. First, it was assumed that there would be no change in agricultural policy over the projection period. Second, the analysis included the effect of both a reduction in export refund limits and an *elimination* of export refunds. Under the 2001 baseline, Irish grain prices are projected to decrease in nominal terms over the period 2000-2010. The value of wheat output is projected to increase, while the value of barley output is set to decrease. The demand for inputs is projected to decline reflecting the reduced intensity of agricultural production. In aggregate terms it is projected that there would be little change in overall agricultural income.

An export subsidy reduction would lead to a decline in grain prices relative to the baseline. This reduction would be more pronounced if export refunds were eliminated. While, *agricultural income is not largely affected* by the **reduction** in export subsidies, the **elimination** of refunds, leads to the *reduction of 20 percent in income* relative to the baseline projections.

In 2002, projections, covering the period 2001-2010, were generated for a revised baseline and a policy scenario which included further extensification of livestock production. In general, the revised baseline projections are not significantly different from the baseline 2001. The extensification of livestock production is projected to lead to a reduction in inputs consumed, including feed, energy and fertiliser application. Under this scenario the Irish agricultural income in 2010 increases relative to the baseline projection, primarily due to the increase in the extensification payments.³

³ At the time of writing (December 2002), it seems unlikely that such a policy would be implemented.

1. Introduction

Since 1998, a set of models developed under the FAPRI-Ireland Partnership⁴ has been used to generate projections and conduct policy analysis for the Irish agricultural sector. The projections cover a 10-year period and are produced annually. The annual modelling output consists of the baseline and the scenario series of projections for the Irish beef, sheep, dairy, cereals and inputs sectors. The baseline result serves as a benchmark as it represents the projection of key agricultural variables in the absence of any policy change. In tandem with the baseline result is the analysis of the effects of a particular policy change on the Irish agri-sector. The continued collaboration between FAPRI at the University of Missouri and Teagasc, gives the FAPRI-Ireland model the considerable advantage of being linked both to the FAPRI EU and World modelling systems. This enables changes in world markets to be traced down through to the equivalent domestic Irish markets (Binfield *et al.* (2000)).

This report covers analysis conducted for the Irish cereals sector and agricultural inputs and incomes during the period 2000 to 2002. There are companion reports which cover the analysis conducted for the other agricultural commodities for the same period and under the same policy assumptions. The analysis was conducted to examine the implications for the Irish cereals sector, inputs and the agricultural incomes of:

- both a **reduction** in export refund limits and an **elimination** of export refunds (as possible changes in trade policy resulting from the WTO Millennium Round negotiations)
- changes to the extensification regime (as a possible policy reform resulting from the mid-term review (MTR) of the CAP).

In order to interpret the results of the analysis in a manner that ensures the maximum benefit to the reader from this research, it is necessary to note the following: presented results are not forecasts but projections, which are generated under a specific set of assumptions about the policy conditions. The evaluation of the effect of a change in policy or other critical factors is made, by comparing the future outlook for the sector under the baseline scenario with the outlook under the alternative scenario. The environment in which the analysis is conducted is constantly evolving, implying that the information set available for the generation of projections is changing. As a result, over time, the outlook for a commodity may change as new information is incorporated into the analysis. Consequently, the baseline projections for the outcome in future years may differ in successive years.

⁴ The FAPRI-Ireland Partnership is a research consortium between the Food and Agriculture Policy Research Institute (FAPRI), Missouri, USA and the Rural Economy Research Centre, Teagasc.

2. The impact of WTO export subsidy reduction and elimination on cereals sector, inputs and agricultural income

The negotiations for the General Agreement on Tariffs and Trade (GATT) Uruguay Round took place over the period 1986 to 1994 and these talks eventually resulted in the Uruguay Round Agreement on Agriculture (URAA) which ran from 1995 to 2001. This was the first time agriculture, invariably a highly protected sector, became subject to these international trade disciplines. The Uruguay Round agreement set an objective of trade liberalisation through a mechanism of increased market access and reduced export subsidisation. Regarding export subsidisation, the reforms included a reduction in both the volume and value of export refunds.

While the reforms eventually agreed achieved only limited success in addressing the trade liberalisation agenda, the negotiations themselves represented an achievement. The URAA resulted in a framework which could discipline agricultural support and protection and make a subsequent round to liberalise agricultural trade, conceptually, and practically, easier (*Matthews, 1999*). With the reforms agreed in the URAA now fully implemented, attention has turned to the current Millennium Round of negotiations under the auspices of the WTO.

After a false start in Seattle in November 1999, the Millennium Round negotiations began in earnest early in 2000. Several negotiating meetings including the Doha Ministerial Conference have already taken place. In the proposals and submissions made as part of the first phase of the Millennium Round negotiations, it is clear that pressure persists from the Cairns group, the USA and other WTO members, for the elimination of the EU's system of export subsidies.⁵ Members of the Cairns group, such as New Zealand and Australia, export at world prices, while the European Union and to some extent the US, subsidise their product exports. Ireland is a major agricultural exporter both within and outside the EU and Irish exports have typically accounted for a large proportion of subsidised exports from the EU, particularly for beef and dairy products. Therefore, any reduction of allowed levels of export subsidisation will have implications for Ireland.

At the time of the analysis (April 2001), the WTO negotiations were entering their second phase and it was not possible to make any clear predictions on the detail of the ultimate Millennium Round agreement. However, some assumptions as to its outcome were necessary in order to formulate the scenarios to be investigated. Therefore, two possible scenarios concerning export subsidies were developed through consultation with the FAPRI-Ireland Steering Group.⁶ The first scenario involved a further *reduction* in export subsidy limits similar to that implemented in the URAA, while the second scenario involved the complete

⁵ See for example agriculture proposal documents G/AG/NG/W/11 and G/AG/NG/W/15 submitted to WTO.

⁶ These scenarios are formulated merely with a view to capturing two possible contrasting outcomes emanating from a reform of the export refund mechanism through WTO. Neither scenario is taken to represent an Irish policy position in relation to these negotiations.

elimination of export subsidies. The assumptions for both scenarios can be summarized as follows⁷:

a. Reduction of export subsidisation at the same rate as under the URAA

- Beginning in 2004, a six-year commitment to progressively reduce the volume of subsidised exports by the same amount as under the URAA, using the same base year chosen for the URAA; by the end of the Millennium Round agreement's implementation period this would amount to a 42 per cent reduction in the quantity restrictions relative to the URAA base year; it is this volume reduction, rather than the reduction in value of export subsidies, which is likely to have most effect on export markets

b. Export subsidy elimination

- The total abolition of export subsidies over a six-year period, starting in 2004

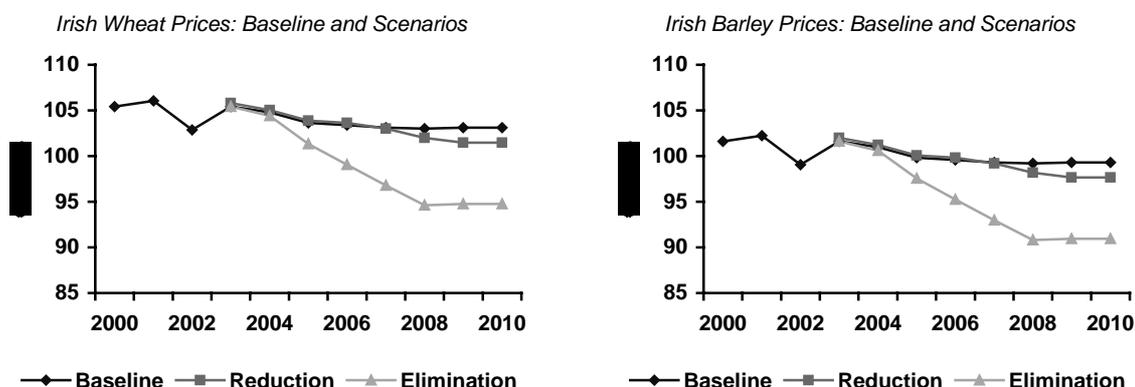
2.1 Cereals sector - 2001 baseline and scenarios

The outlook for the cereals sector in Ireland for the period 2001-2010, under no policy change scenario, is very similar to that for the EU cereals sector as a whole. Despite strong growth in the level of prices on world markets, Irish grain prices (feed barley and wheat) are projected to be about 2 per cent lower in nominal terms in 2010 compared to 2000 levels. With ten per cent compulsory set-aside assumed throughout the projection period, and lower nominal prices, total Irish cereal area planted is projected to decline by 2 per cent by 2010.

In the export subsidies *reduction* scenario Irish wheat and barley prices are not greatly reduced relative to the prices that are projected under the baseline. As illustrated in Figure 2.1, Irish wheat and barley prices are, by 2010, approximately 1.5 percent lower than under the baseline. The impact of the *reduction* in export subsidies on Irish cereal prices is similar to the impact on the EU average price. The supply and demand effects of the small price declines that occur under the export subsidy *reduction* scenario are not very large. By the end of the period both Irish wheat and barley production are approximately unchanged relative to the Baseline.

⁷ The details of the scenarios and the underlying assumptions can be found in Binfield *et al.* (2001b)

Figure 2.1 Irish wheat and barley prices under 2001 baseline and scenarios



Source: FAPRI-Ireland Partnership Model (2001)

Source: FAPRI-Ireland Partnership Model (2001)

Under the export subsidy *elimination* scenario the price declines are greater in magnitude than under the *reduction* scenario. Irish wheat prices are, by 2010, a little over 8 per cent lower than under the Baseline. Irish barley prices decline, so that relative to the Baseline, they are approximately 8.5 per cent down on the Baseline level in that year. Detailed analysis for the cereal sector can be found in Binfield *et al.* (2001a, 2001b).

2.2 Inputs - 2001 baseline and scenarios

Changes in the consumption levels of Irish inputs are derived from changes in the demand for farm outputs that they are used to produce, and by changes in the prices of inputs. In 2000 Irish prices of energy and fertilizer inputs were significantly affected by the sharp rise in the price of crude oil on international markets and by the continued weakness of the euro against the dollar. As a result, under the baseline 2001, consumption of and expenditure on inputs is projected to decline between 2000 and 2010.

A projected decline in animal numbers and in the intensity of production in the dairy and beef sectors also reduces the demand for inputs. The projected reduction in the intensity of livestock production is reflected in the level of fertilizer application that is projected for the period 2000-2010. Among the factors that are driving the reduced intensity of production are policies such as REPS and the increase in the number of part-time farmers.

The projections of intermediate consumption under the export subsidy *reduction* scenario are not greatly different to the baseline (reduction of 1 per cent in 2010 relative to the baseline). However, there is a 5 per cent reduction in inputs demand under the *elimination* scenario relative to the projections under the baseline.

2.3 Agricultural income (operating surplus) - 2001 baseline and scenarios

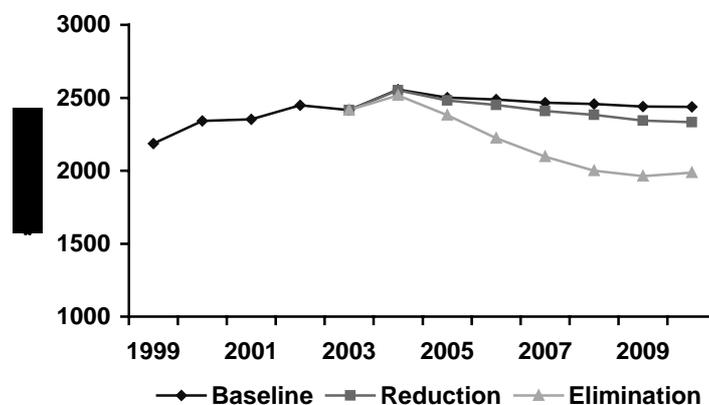
Operating surplus is defined as the sum of agricultural gross value added and subsidies net of taxes, minus intermediate consumption, fixed capital consumption (depreciation) and compensation to employees. The projected path of operating surplus under the baseline and the two export refund scenarios is illustrated in Figure 2.2. Under the no policy change, or baseline scenario, operating surplus in agriculture is projected to increase by 4 percent over the projection period. While the agricultural output *at basic prices* is projected to increase by only 2 per cent over the projection period, subsidies net of taxes are projected to increase by 5 percent.

Relative to the baseline, the effect of the export subsidy *reduction* scenario on sectoral output values is very modest. Only the dairy sector experiences a significant reduction in output value relative to the baseline. In total these changes result in a 2 percent reduction in agricultural output by 2010 relative to the baseline. By 2010, agricultural gross value added is down almost 4 percent relative to the baseline. Overall the operating surplus of the sector is just over 4 percent lower in 2010 than under the baseline.

In contrast to the export subsidy *reduction* scenario, the export subsidy *elimination* scenario has more significant implications for the output value of almost all commodity sectors. Most affected are the cattle and milk sectors, which by 2010 exhibit declines in output value of 22 percent and 19 percent respectively relative to the baseline. The effect on other sectors is less substantial, with pig, sheep and cereal output value declining by 10 percent, 8 percent and 4 percent respectively.⁸ These output declines imply a reduction of 10 percent in agricultural output relative to the baseline in 2010. Intermediate consumption declines relative to the 2010 baseline, largely because of reduced feeding stuff, fertiliser and energy expenditure. Collectively, these factors imply a 19 percent reduction in operating surplus relative to the baseline 2010 position.

⁸ As the EU is a net importer of sheepmeat, export refunds are not of major importance to the sector. However, this does not mean that the sector will be largely immune to the consequences of the next WTO round. Although not examined here, a reduction in tariff quotas or an increase in minimum access limits could have significant consequences for the sector.

Figure 2.2 Operating surplus under baseline and export subsidy scenarios



Source: FAPRI-Ireland Partnership Model (2001)

3. Analysis of the impact of changes to the extensification regime

In 2002 the European Commission undertook a mid-term review (MTR) of the Agenda 2000 reforms. At the time of the analysis (April 2002), there were diverging opinions as to what this process would involve. There were some that believed that these negotiations provided the opportunity to radically reform the CAP, perhaps to address the shortcomings that many felt resulted from the compromise in the eventual Agenda 2000 Agreement of 1999. For others the review was supposed to be confined to the effectiveness of the measures that have been put in place.

Taking into account the WTO negotiations, the enlargement of the EU, as well as the internal pressures to reform (coming from the BSE and FMD crises), it was clear at the time of the formulation of the policy scenario, that there would be pressure to change elements of the CAP. It was evident, that there was a general agreement on changing the focus of support from direct support of agriculture to the “second pillar” of the CAP through increased funding of environmental and rural development measures. Against this background, it was decided that the impact of a change in the extensification regime for beef would be examined in the 2002 FAPRI-Ireland outlook for Irish agriculture.

Under the Agenda 2000 reform, two extensification limits were introduced to influence the level and type of EU beef production. The basic concept behind extensification is to provide incentives for beef producers to hold fewer animals per hectare of land. Producers are compensated for the loss of receipts from more extensive production by the introduction of extensification payments, which are on a per animal basis. The payments introduced under the extensification scheme are conditional on the adherence of the producer to one of two different stocking density limits. Producers have the option to stock their farms at either less than 1.4 livestock unit (LU) per hectare or between 1.4 and 1.8 LU per

hectare. The lower the stocking density rate the higher the extensification payment.

Under the scenario performed in this analysis, the two extensification limits of 1.4 and 1.8 LU per hectare are reduced by 0.2 LU. Thus, the new limits for receipt of extensification payments are a stocking density level between 1.2 and 1.6 LU per hectare and a stocking density of less than 1.2 LU per hectare. Increased payments are set so as to ensure that the scenario is at the very worst income-neutral for Irish producers, that is, no Irish producer is expected to be worse off under the scenario. The aim of the scenario is to quantify the reduction in beef animals and consequential impacts on production and incomes likely to be associated with these new limits.

3.1 Cereals sector - 2002 baseline and scenario

In terms of cereals sector, the revised baseline produced in 2002 differs slightly from the baseline 2001. Crops prices, yields and enterprise areas are projected to be similar to those projected the year before. The relatively static outlook for cereal prices over the 2000-2010 period results in the cereal area declining marginally between 2000 and 2010. Coupled with the steady increase in yields this results in only a slight decline in the production of both wheat and barley by 2010. The projections regarding the cereal sector under the extensification scenario as defined above are not significantly different from the baseline projections.

3.2 Inputs - 2002 baseline and scenario

The year 2001 saw increased expenditure on dairy feed stuffs in Irish agriculture. Most of this increased expenditure resulted from the precautions taken to prevent the outbreak of FMD in Ireland. However, the general trend in all variables remains the same in 2002 baseline.

In the extensification scenario, a decrease in the number of animals per hectare leads to a reduction in the amount of inputs consumed. Less feed is consumed per head and there is a decline in cattle and sheep numbers. There are other ancillary effects. The decline in total beef cattle numbers results in marginally more area being available for dairy production. Consequently, the quantity of dairy feed consumed declines by just over one percent per head relative to the baseline projection for 2010. Expenditure on other non-feed input items such as nitrogen and energy declines by around one per cent relative to the baseline.

3.3 Agricultural income (operating surplus) - 2002 baseline and scenario

The new accounting procedures adopted by the CSO for the 2001 Output, Input and Income Accounts (see Appendix for more explanation) resulted in (amongst other things) the division of the total subsidies to agriculture figure into two components. The first component "subsidies on products" relates to subsidies which are directly tied to production. These payments include special beef

premiums, suckler cow premiums, dairy and beef payments, beef national envelope and slaughter premiums. The second component – “subsidies on production” consists of all other subsidy payments and includes REPS payments, headage, arable aid and extensification payments.

Over the period 2000 – 2010 subsidies on products are set to increase by 17 per cent under the baseline. Most of this increase is set to arise from changes in policy brought in under the Agenda 2000 reforms. The main increases in the payments are in the beef sector and are for slaughter premia and the beef national envelope, which are both set to rise considerably.

Subsidies on production are set to increase by 70 per cent between 2000 and 2010. As with subsidies on products, most of the increase in subsidies on production are due to changes brought about by the Agenda 2000 CAP reform. The main increases are in the levels of the beef national envelope, extensification payments and the introduction of direct payments for milk production.

Although the projections of agricultural output at basic prices are revised downwards relative to the 2001 baseline, its projected composition under the baseline 2002 remains unchanged. As before, by 2010 it is projected that goods output will decline, while subsidies net of taxes are projected to increase, leaving agricultural output at basic prices relatively static. The projection of the operating surplus in 2010 under the revised baseline is a 3 per cent increase, a slight downward adjustment on the previous year’s projections.

Under the extensification scenario total livestock output value increases. This is mainly due to projected increases in the value of the beef sector. The decline in output volume caused by the reduction in livestock numbers is outweighed by the increase in EU and Irish beef prices due to a projected decline in supply.

Under the scenario, extensification payments are increased to ensure that the scenario is income “neutral” in terms of the compensatory payments foregone by a move to a lower stocking rate per hectare. Therefore, aggregate subsidy levels are increased relative to baseline levels. In particular, subsidies on production are up by over four per cent in 2010 on the levels projected under the baseline. With input expenditure declining by one per cent the net effect of the extensification changes is a four per cent increase in Irish agricultural incomes in 2010 relative to their baseline level.

3.4 Conclusion

Under the baseline, a three per cent rise in overall agricultural income is projected between 2000 and 2010. The main reason for this increase is the projected rise in subsidy payments accruing to the sector from the policy changes outlined in the Agenda 2000 CAP reform process. Most of the increases in these payments originate in the beef and dairy sectors. Without the projected

increase in subsidy payments, agricultural incomes in Ireland would fall between 2000 and 2010.

All results presented in this paper are in nominal terms. Consequently, with inflation projected to be about three percent on average annually over the same period, real agricultural income is set to decline between 2000 and 2010. However, farmer numbers are set to fall during the same period with various different reports such as the Agri-Food 2010 committee (Department of Agriculture, Food and Rural Development (2000)) suggesting that farmer numbers could fall by up to three per cent per annum depending on the prevailing agricultural policy climate. Should this trend prevail, then on a per capita basis, real income levels in agriculture are destined to remain relatively static.

Appendix

Introduction	The historical estimates and projections are based on a new methodology arising from the revision of the System of National Accounts in 1995.
National farm	The concept of the “National farm” has been dropped. With this change, certain transactions between farms and between different enterprises within the same farm are now valued as both output and intermediate consumption.
Basic prices	Output is now valued added at basic prices. The basic price corresponds to the producer (ex-farm) price plus any subsidies directly linked to a product minus any taxes on products. VAT is excluded. Subsidies and taxes linked to production are not included in output.
Agricultural services	Activities performed by agricultural contractors directly related to the production of agricultural products (e.g. harvesting) are an integral part of agriculture. The value of such work is included as output and also as intermediate consumption.
Fixed capital consumption	This relates to foreseeable wear and tear and obsolescence of fixed capital goods. It is calculated on the basis of the probable economic life of the asset. It is not calculated for breeding livestock or for non-produced assets such as land.
Compensation of employees	This includes remuneration in cash and in kind. It does not include the remuneration of work undertaken by the farmer or by non-salaried family farm members.
Operating surplus	This indicator is an approximation for the income indicator used under the old agricultural accounts methodology. It is calculated before deductions for interest payments on borrowed capital and before deductions for land annuities and for rent paid by farmers to landowners for the use of their land.

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