"Projections of Agricultural Incomes"

Kieran McQuinn

June 2001
Project No: 4345

Summary

This report documents work completed on the inputs and income component of the FAPRI-Ireland model, which has been operational for policy analysis since December 1998. The report will present the results of three major different policies analysed over this period. The model itself is decomposed into two primary constituents – the first is a model of aggregate Irish input consumption by agricultural producers and secondly the overall aggregate income figure for Irish agriculture. Output models have been constructed for dairy, livestock products and crops. The aim of the income model is to replicate line for line the Central Statistics Office (CSO) Agricultural Output, Input and Income table for a "baseline" result and for different policy scenarios.

Objectives
As an example of the models capability the results of three scenario questions will be presented. The initial focus of the FAPRI-Ireland model was the proposals of the European Commission in March of 1998 for the changes to the Common Agricultural Policy (CAP) under Agenda 2000. These results were then compared with the results of the policy changes agreed by the heads of state a year later in 1999. In addition to these two institutional policy changes a third and different scenario is examined – the effects of exchange rate volatility between the dollar and the euro. With some European produce prices approaching world market levels, exchange rate movements have increased significance for the agricultural sector.

Methodology
The inputs and income model is one component of the FAPRI-Ireland sector wide model of Irish agriculture. These models are interlinked to examine the cross commodity effect of different policy proposals as well as general commodity market trends. As a consequence of this linked approach an aggregate income level is calculated. The Irish model resides within a broader world-wide system of commodity models which has been built and is maintained both at FAPRI at the University of Missouri at Columbia and at Iowa State University. Consequently the effects of policy and macro economic level changes at both a world and EU wide level can be traced through to the Irish agricultural sector.

Key Findings
Inputs in Irish agriculture were projected to remain relatively unaffected by the CAP policy reform. Compared to a situation where no policy change was implemented, input expenditure was projected to fall by just 1 per cent due to the policy change. Total agricultural income is significantly affected by the agreed reforms. If the reforms had not taken place agricultural income levels were projected to fall by 9 per cent between 1998 and 2007. However, implementation of the reforms increased income by 8 per cent above this level. Therefore Irish income levels were projected to be relatively static in nominal terms between 1998 and 2007. The composition of this income figure is set to change considerably with EU subsidies set to constitute a much higher proportion of total income than before.

Different euro/dollar exchange rates resulted in changes of 6 per cent in Irish agricultural income.

Introduction

Work commenced on the creation of the FAPRI-Ireland model of the agricultural sector in September of 1997. Just over a year later the first official results of the model were presented at the Teagasc Agri-Feed Economics conference. The centre piece of the modelling output is the “baseline”, a ten year projection of the main agricultural variables for the different commodity groups in the absence of any policy change. These results are then aggregated for the different sectors of the agricultural economy to arrive at an overall agricultural income level. Policy changes or “scenarios” are then evaluated with respect to this baseline. The difference between the two sets of results are discussed in absolute and percentage terms. This allows the model to isolate the projected implications of a particular policy change from more general market trends.

FAPRI (Food and Agriculture Policy Research Institute) at both the Universities of Missouri and at Iowa State have over the past 20 years created and maintained a comprehensive world modelling system for a variety of different agricultural commodities. Every year these models are simulated to produce the annual baseline results for the different commodities. The scope of the modelling effort conducted by FAPRI allows for the analysis of proposed policy changes at an EU and at a global level permitting analysis for instance of suggested WTO policy scenarios. The Irish model presently is linked to the FAPRI EU-GOLD model through a series of price transmission relationships. The essential assumption made here is that while Irish output prices are mainly determined by what is happening at an EU level, changes in these Irish prices does not result in significant movements in the corresponding EU price.

The Irish model also takes exogenous data from domestic non-agricultural models such as the Economic and Social Research Institute’s (ESRI) Hermes model of the Irish economy. Some of these variables include national income levels and general cost of living indicators. Exchange rate projections are also used particularly in determining trade flows in agricultural commodities between different trading blocs. The Inputs model is particularly dependent on non-agricultural exogenous data. The model takes projections from the Hermes model of relevant input price indicators such as energy and labour costs. In many instances the rate of price inflation for these inputs far exceeds that of agricultural output prices thereby resulting in a continuous price-cost squeeze for producers.

The report is centred around the results of three different policy simulations conducted during the December 1998 – March 2000 time period. These three different scenarios illustrate the sensitivity of the Irish agricultural sector not just to changes in European agricultural policy but to variability in macroeconomic indicators. A summary of results from the following three scenarios will be presented and briefly discussed:

1. The proposed Agenda 2000 reforms to the Common Agricultural Policy (CAP) as outlined in March 1998.

2. The agreed March 1999 CAP reforms as contained in the Agenda 2000 Berlin Agreement

3. A sensitivity analysis of impact of different euro/dollar exchange rates

1 Agenda 2000 March 1998 Commission Proposals[1]

In March 1998 the European Commission published a series of proposals intended to form the backbone of the Agenda 2000 reforms. The first objective of the FAPRI-Ireland model once constructed was to examine the effects of these proposals on the Irish agricultural sector.

The effects of the original Agenda 2000 proposals on Irish inputs and income were mainly determined by the proposals impact on the different farm outputs. No particular proposal was devised specifically for inputs. However the consumption of fertiliser, compound feed and other inputs is obviously determined by changes in the dairy, livestock and crops sectors. The main Agenda proposals for output commodities included the following:

- Dairy quotas to be expanded by 2 per cent with a 15 per cent reduction in dairy product intervention prices. Dairy producers to be partially compensated for the reduction in support with a set of increasing direct payments.
- Beef intervention prices to be reduced by 30 per cent. An increase in direct compensation to be provided to producers, again to offset at least a portion of the anticipated decline in prices.
- Cereal set-aside to be set at a default rate of 0 per cent with a simultaneous 20 per cent reduction in cereal intervention prices. As with dairy and beef, producers were to receive an increase in direct income payments to compensate for part of the decline in prices.

1.1 Projections of Inputs

The effects of the different Agenda 2000 proposals on the various Irish output sectors are analysed in detail in Binfield, Henchion and Young (1998), Donnellan et al. (1998) and McQuinn and Riordan (1998). Table 1 below summarises the implications of the proposals on Inputs. In the interests of brevity and clarity only the difference between the Agenda 2000 proposals and the baseline are presented here.

Table 1.1: Summary of Inputs Projections Agenda 2000: Data refer to 2005

		Baseline	Agenda 2000	% Change
Dairy Rations Per Head	Kg/hd	557	583.9	+5
Beef Rations Per Head	Kg/hd	132.2	128.6	-3
Nitrogen Application	(000) tonnes	353	341	-3
Total Inputs	£m	1737	1703	-2

The Agenda 2000 proposals were projected to affect feed use through the reduced price of concentrates and the continued expected downward pressure on carcass weights in the beef sector. Dairy ration consumption on the other hand was expected to increase by about 5 per cent in 2005 from its baseline position. Livestock producers on the dairy side were expected to avail of the relatively cheaper concentrate prices brought about by lower cereal prices.

Consumption of beef rations per head were projected to fall by about 3 per cent in 2005 from its baseline level. This occurs even with the lower cattle fattening meal price. This effect can be linked to the fact that carcass weights were projected to fall by almost 11 per cent from the baseline position by 2005 under the Agenda 2000 proposals. Thus the main implication of the Agenda 2000 proposals for inputs was on feeds. Fertiliser consumption was also expected to fall due to the fall in profitability of the beef and dairy sectors. Overall total nitrogen application was down about 3 per cent on where it would have been if the proposals had not been applied.

The only input items, which were expected to show an increase under the Agenda 2000 proposals were those connected to the crops sector – expenditure on crop protection services and seed. This was due to the increase in cereal area sown envisaged under the proposals due to the reduction in

[1] Results from this analysis were originally published in the Agri-Food economics Conference proceedings of 1998.

compulsory set-aside to a rate of 0. Overall therefore total input expenditure was expected to decline marginally under the Agenda 2000 proposals.

1.2 Projections of value of Agricultural Output and Income

The effects of the Agenda 2000 proposals on input levels and expenditure can be combined with changes in the output levels of each commodity and proposed increases in European subsidies to determine income levels for agricultural producers.

Through the model linkages discussed earlier the cross commodity effects of many of the sector specific proposals are captured. For example, price reductions on the feed grain side translate into lower production costs for the livestock and dairy sectors. Similarly, changing output values of the different sectors have implications for the manner in which total agricultural land is allocated.

The principal result of the Agenda 2000 proposals was a 10 per cent reduction in the income figure compared with the baseline by 2005. This constituted an almost 15 per cent reduction on 1997 actual income levels. Agricultural income levels under Agenda 2000 were projected to be at £1758m in 2005. Table 2 summarises the results for each of the main components of Irish agriculture.

Table 1.2: Agenda 2000 Projections for the main Agricultural Sectors; Data relate to 2005[2]

	Agenda 2000 £m	Compared with baseline % Change	Compared with 1997 % Change
Income	1758	-5.3	-10
Livestock Output	1283	-23	-27
Livestock Products Output	1038	-10	-9
Crops Outputs	516	+1	+26
Inputs Expenditure	1703	-2	+3.2
Subsidies	1224	+28	+30

The sector projected to be most affected by the original Agenda 2000 proposals was beef. Its value was projected to fall by 35 per cent on its baseline level. Price cuts of 20 per cent and a 10 per cent reduction in cow numbers were anticipated. Carcass weights were also expected to fall by almost 10 per cent from the baseline level due to the proposals. The proposals did however include a 66 per cent increase in direct payments and compensation.

The value of the sheep sector was projected to decline by 11 per cent compared with the baseline. This was due to an expected price generated by the effects of the beef price decline. This price reduction partially offset by increased premia, was projected to lead to a marginal fall in the ewe flock, sheep output volume and consequently sheep output value.

The dairy sector was projected to be affected by a 15 per cent intervention price cut in butter and skimmed milk powder. This resulted in an expected fall in the Irish milk prices of 12 per cent by 2005 compared with the baseline. The price drop was projected to be marginally offset by the increased quota so the value of the dairy sector was expected to fall by 11 per cent. Additional dairy premium of approximately $105 million was expected to partially offset this fall in value. The crops sector was expected to be marginally affected by the proposals with total output value increasing by 1 per cent.

The largest increase is in subsidies, which was expected to increase by some 30 per cent over the baseline level. The major contributor to this was the proposed dairy and beef payments compensation proposals. These payments were projected to increase by 2005 to some £137m per annum.

The original Agenda 2000 proposals were the first proposals to be analysed by the FAPRI-Ireland model. The outcome did not make for happy reading for the agricultural sector. The end product of the analysis was an expected 10 per cent decline in Irish agricultural incomes due to the proposed

[2] The headings adopted in this report and in all other FAPRI-Ireland publications for output values reflect those used by the CSO in the Output, Input and Income Table published annually.

Agenda 2000 proposals. This as with all results is in nominal terms. Using projections of national income from the ESRI, the projected significance of the agricultural sector under these reforms can be gauged from Table 1.3 below.

Table 1.3: Agricultural Income as a proportion of GNP

	1997	Baseline 2005	Agenda 2005
% Share	4.7	2.5	2.2

2 Berlin Agreement[3]

The second set of results presented here is an analysis of the projected impact of the actual reforms agreed under Agenda 2000. The results can be compared with the results presented in the first section, which looked at the projected implications of the original proposals. The format of the presentation is the same, with projections of inputs presented first, followed by the income projections for the agricultural sector as a whole. As with the initial set of proposals there were no direct effects of Agenda 2000 for the inputs sector. However there were many projected indirect effects accruing from expected changes in outputs.

The finalised reforms labelled the "Berlin Agreement " represented a watering down of many of the proposals outlined in March 1998. The agreed proposals reduced the price supports for beef, cereals and dairy products whilst increasing the level of direct payments made to producers. The following is a brief summary of the major components of the agreement:

- The Irish dairy sector was given a 2.9% quota increase – above that previously proposed. Intervention price reductions and the implementation of direct payments, which were to begin in 2000/01 were now deferred to 2005.
- The basic level of beef market support is reduced by 20 per cent by 2002/03. Various direct payment schemes for cattle producers are introduced or expanded to offset the reduction in beef market support.
- Intervention prices for cereals are reduced by 15 per cent between 1999 and 2001. Compensatory payments to cereal producers are increased by 16 per cent to offset the reduction in market support.

The main changes wrought by the agreement in Irish input consumption were expected to be cheaper compound prices and changes in the intensity of production in the Irish dairy and beef sectors. Dairy feed per head was expected to increase under both the baseline and the agreed reforms reflecting the significant increase in milk output per cow under both scenarios and the slight increase in stocking density levels. Static carcass weights results in beef ration consumption on a per head basis remaining unchanged under the baseline. However a significant drop in carcass weights envisaged under the Berlin Agreement resulted in a fall in projected consumption of beef rations. Nitrogen application levels were expected to increase under the Berlin Agreement relative to the baseline due to a slight increase in the intensity of dairy production. Table 2.1 summarises the results

Table 2.1: Summary of projections of Irish Inputs in 2007 under the Berlin Agreement

		Baseline	Berlin Agreement	% Change
Dairy Rations Per Head	Kg/hd	642	648	1
Beef Rations Per Head	Kg/hd	140	130	-7
Nitrogen Application	(000) tonnes	418	419	0
Total Inputs	£m	1761	1742	-1

[3] Results from this analysis were originally published in a special session of the Irish Agricultural Economics Society May 1999.

2.1 Projections of Irish Agricultural Income

Gross Agricultural Output (GAO) is comprised of values for the livestock (cattle, sheep, pigs and poultry), livestock products (milk) and the crops (cereals + other crops) sectors. Table 2.2 presents the projections under the baseline and Berlin Agreement scenarios.

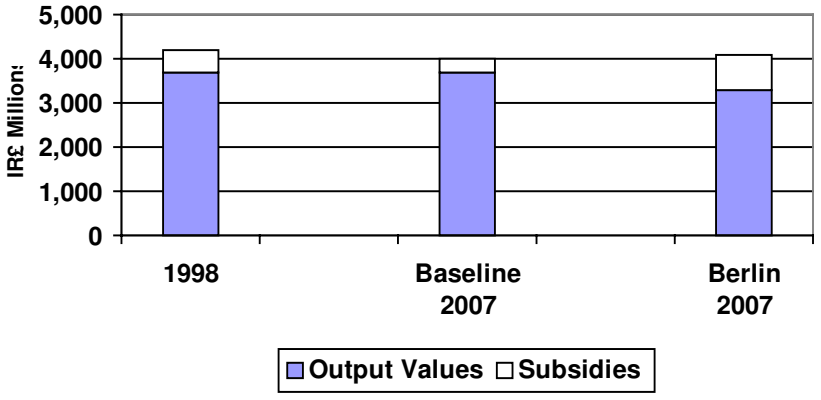
Table 2.2: Projections for Gross Agricultural Output in 2007.

	Baseline £m	Berlin Agreement £m	% Change
Cattle	970	802	-17
Pigs	226	220	-3
Livestock	**1585**	**1401**	**-12**
Milk	1188	1072	-8
Livestock Products	**1163**	**1101**	**-7**
Cereals	111	104	-6
Other Crops	340	340	0
Crops	**451**	**444**	**-2**
GAO	**3223**	**2946**	**-9**

Under the Berlin Agreement the livestock sector was projected to be affected the most with a fall in value of 12 per cent on the baseline level. The cattle sector was expected to witness a 13 per cent fall in the price of finished animals. Carcass weights were also expected to fall by about 4 per cent due to lower market prices. Therefore overall cattle values were expected to decline by 17 per cent on the baseline level. The reforms were expected to affect the pigs sector through lower meat prices whilst the sheep sector was expected to be affected marginally through changes in extensification.

The Berlin Agreement was envisaged to affect the dairy sector in two stages. Firstly through the initial increase in quota in 2000/01 through 2001/02, which was expected to result in a decline in the milk price facing producers by about 2 per cent. The further increase in quota in 2007 was expected to result in a greater price decline of 11 per cent on the baseline level. The fall in price plus the increase in expected output levels saw the dairy sector expected value fall by 8 per cent. The cereals sector is expected to see a decline of about 6 per cent in market receipts due to the reforms. However like most of the affected output sectors, the cereals sector witnessed significant increases in direct payments due to the reforms. Overall total Irish output value was projected to be down about 9 per cent on baseline levels in 2007.

Figure 2-1: Total Agricultural Revenues (Output Values + Subsidies)



Under the Berlin Agreement subsidy payments were expected to increase by 42 per cent on the baseline position. Most of the projected increase was expected to accrue to the beef sector where the main constituents were the special beef premia, suckler premia and the slaughter premia. The dairy sector from 2005 onwards was projected to be in receipt of a direct payments package and cereal direct payments were also increased.

Total revenues were projected to increase by 3 per cent above the baseline level as a result of these increased payments. The end consequence of this is that Irish income levels were expected to increase by about 9 per cent on baseline levels and thus remain identical to actual 1998 income figures. A significant conclusion to emerge from the analysis is that by 2007 subsidies would constitute 71 per cent of Irish agricultural income compared to 56 per cent in 1998.

3 Exchange Rates Volatility and Irish Income Levels[4].

The previous two sections of this report have provided examples of the effects of major changes in the CAP on the future of Irish agriculture. Indeed the FAPRI-Ireland model was specifically created to handle this kind of analysis. However an exclusive focus on the effects of changes in EU agricultural policy underplays the effect to which the Irish agricultural sector is exposed to changes in other non-agricultural markets. This increased sensitivity to non-agricultural forces has been heightened by the agricultural reform process itself, which has increasingly brought domestic EU market prices in line with those pertaining on world markets. By achieving this, domestic prices are more sensitive to movements in currency movements. For instance a sharp devaluation in the value of the euro results in EU produce becoming more competitive on the world market.

As the FAPRI-Ireland model is part of a larger global system, which is used to analyse trade paths between large international trading blocs, projections of exchange rates between these trading blocs are needed. FAPRI at the University of Missouri and Iowa State in compiling the annual baseline usually employ the services of macroeconomic forecasting agencies such as Wharton Econometrics Forecasting Associates (WEFA), Data Resources Incorporated (DRI) and Project Link (United Nations) for forecasts of these macroeconomic variables. As a component of the overall modelling system the FAPRI-Ireland model's results are also subject to these forecasts. Because of the increased importance of exchange rate movements in EU commodity analysis, the FAPRI-Ireland team decided to conduct an analysis of the sensitivity of the Irish agricultural sector to alternative projections of the euro/dollar exchange rate. In doing so some measure of the sensitivity of the Irish agricultural sector to these variables could be established.

The exchange rate adopted in the baseline simulation in 1999, projected that the euro would appreciate against the dollar over the projection period (1999-2007) from $1.11 to $1.22. Projections for all the different components of the Irish agricultural economy were made under this baseline. FAPRI at the University of Missouri then performed two additional exchange rate scenarios:

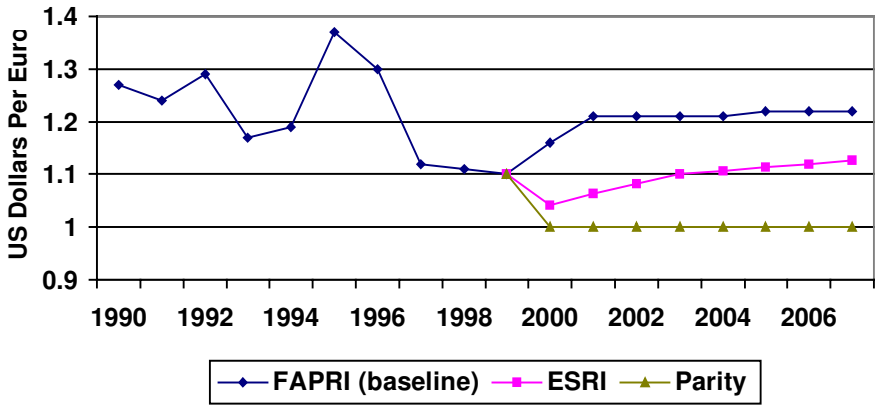
1. Using the ESRI forecast of the euro/dollar exchange rate which had the euro appreciating to $1.13
2. Adopting a parity scenario of 1 euro to 1 dollar for the entire period.

The decision to take different exchange rates for the euro/dollar rate was done for a number of reasons. Firstly, a large portion of the commodities in the FAPRI world modelling system have as their world representative price the commodity price designated in US dollars. Thus, this rate is the most significant rate for internal EU commodity prices. Secondly the path of the euro/dollar has not progressed as many economists/forecasters had envisaged. In particular the weakness of the euro has been contrary to most forecasts.

Figure 3.1 illustrates the different paths of these exchange rates.

Figure 3-1: Baseline and Alternative Scenario Exchange Rates

[4] The results from this analysis were originally published in the inaugural Outlook 2000 conference hosted by Rural Economy March 2000.



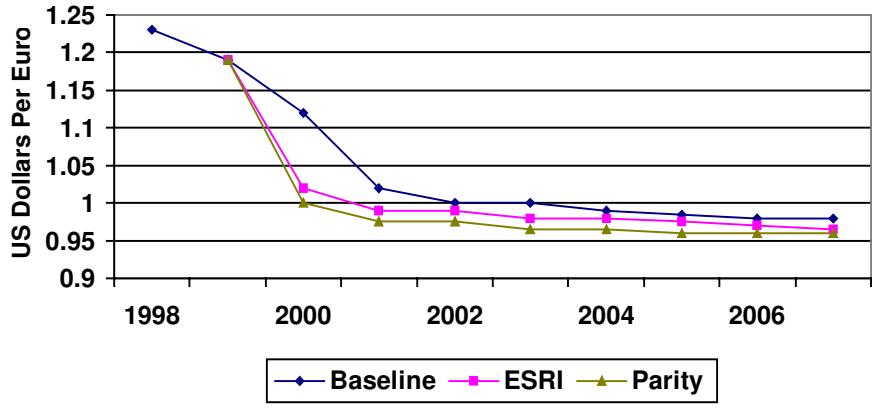
Source: FAPRI and ESRI

Obviously the greatest contrast to emerge is between the baseline exchange rate and the parity assumption. In order to explain the exact manner in which different exchange rates can affect Irish output values and consequently income, an example is presented below from the grains sector.

3.1 EU Wheat and Barley Prices under Differing Exchange Rate Assumptions

EU grain prices tend to be relatively closer to world prices than other EU commodity prices. Therefore the grain sector is the most sensitive of all the commodity sectors to fluctuations in the euro/dollar exchange rate. The greater the strength of the dollar against the euro the earlier the EU will be in a position to commercially export grains onto the world market. By commercially exporting the produce out onto world markets internal EU prices are effectively bid up or increased. In such a scenario downward pressure is exerted on the world prices owing to the extra supply coming from the EU. Conversely a stronger euro delays the passage of unsubsidised grain onto world markets and keeps EU grain prices relatively depressed. Figure 3.2 plots the ratio of EU wheat prices to equivalent world wheat prices under the 3 different exchange rate scenarios.

Figure 3-2: ratio of EU Wheat Price to Equivalent World Wheat Price Under Different Exchange Rate Scenarios



From the graph it is evident that under the baseline exchange rate the internal wheat price exceeds the world equivalent price until 2003. Thus commercial exports of wheat are only possible after this date. Under the alternative exchange rate scenarios, the world price exceeds the internal wheat price by 2001. Thus wheat produce leaves the EU market commercially much earlier then under the baseline case.

The net consequence of this is that internal EU prices are increased considerably under the weaker euro scenarios. In turn domestic Irish grain prices are bid up with producers enjoying higher returns. Under the parity exchange rate scenario the domestic Irish wheat price was projected to be 13 per cent above the baseline level. The cereals sector is the most sensitive to exchange rate fluctuations

as EU internal wheat prices are closer to the representative world price than are other commodities. Thus, output values for the cereal sectors are increased above their baseline level.

3.2 Overall Income

The parity scenario provides the greatest contrast in the overall income picture. The relatively lower euro value under this scenario results in almost all CAP commodities experiencing higher prices than under the baseline. In the case of beef and cereals the lower relative value of the euro brings forward the date at which the EU can commercially export produce onto world markets. This has the effect of increasing internal prices for these commodities. The lower the relative euro value the earlier produce can leave the EU unsubsidised. In the case of the dairy sector, even with the lower euro value internal EU prices are projected to remain above world prices; therefore the EU is never in a position to commercially export. However the EU is in a better position to exploit export refunds. The higher levels of exports as a consequence of this has the effect of reducing internal stock levels and raising internal prices.

Other livestock commodities such as sheep and pigs see higher internal prices due to the higher price of beef. Therefore all CAP output values are increased in Irish agriculture due to a relatively weaker euro. The weaker the euro the greater the increase in value as against the baseline values. The only negative consequence of a weaker exchange rate for Irish agriculture is the relatively higher cost of compound feed as against the baseline. This is purely driven by the higher price of cereals, which results in higher feed grain prices. Table 3.1 contrasts the difference in output values and feed grain expenditure under the different exchange rate scenarios.

Table 3.1 Comparison of Projections using the Alternative Exchange Rates

	ESRI Scenario % Difference from Baseline 2007	Parity Scenario % Difference from Baseline 2007
Beef Value	4	10
Total Livestock Value	3	8
Dairy Value	3	6
Cereal Value	6	19
Feed Expenditure	4	10
Total Agricultural Income	2	6

The parity scenario is expected to result in total agricultural income being increased by a considerable 6 per cent on the baseline value. Under the ESRI scenario, which envisages a relatively mild appreciation of the euro against the dollar, total income is up 2 per cent on the baseline.

4 Conclusion.

This report has sought to provide an understanding of the Irish inputs and income components of the FAPRI-Ireland model which has been built and is being maintained at Rural Economy-Research Centre, Teagasc. The overall model has been used extensively to model agricultural policy, in particular changes to the CAP. However the model has also been used to analyse the sensitivity of the Irish agricultural sector to variability in macroeconomic indicators such as the euro/dollar exchange rates. This latter piece of analysis is particularly important as it heralds the increased exposure of the Irish agricultural sector to movements in international commodity trade. This has originated due to successive reforms of the CAP, which has brought internal EU prices much closer to their corresponding world representative prices and is likely to grow in importance in years to come.

The inputs component of the FAPRI-Ireland model is particularly important as it illustrates the manner in which the different output models are interlinked. Whilst no specific policy instrument within the CAP was directly used to affect input consumption, usage was affected through the variety of policy instruments used to target the different output commodities. In general many of these policy instruments affected the intensity of production i.e. carcass weights and the number of animals in the livestock sectors. This reduction in the intensity of production is directly assumed to affect input consumption such as feed rations and fertiliser application. Thus in many instances both the proposed and actual reform of the CAP has resulted in a reduction in the application of different input types.

The income part of the model is used to calculate the sector wide effect of the different policy changes. As such the model proves to be a useful check on the performance of the entire model identifying very quickly if mistakes or unusual results exist. The income component was devised to specifically imitate the CSO “Output, Input and Income Table”, which is the official record of Irish agricultural income levels.

In general Irish agricultural income has been effectively stabilised in nominal terms for the next 6 to 7 years due to the Agenda 2000 finalised reforms. The large increase in subsidy payments have effectively ensured this. However the changing nature of the income figure and the projected increased component of income coming from a relatively riskless source - direct payments will in itself pose questions both for the sector and for those who seek to model behaviour in it.

Related Reading:

Agricultural sector outlook for Ireland
Binfield J., T. Donnellan and K. McQuinn (2000). Proceedings Outlook 2000: Medium Term Analysis for the Agri-Food Sector. Dublin.

Livestock Sector Outlook for Ireland
Binfield J., M.Henchion and R. Young (1998) Proceedings Agri-Food Economics Conference 1998. Teagasc, Dublin.

Analysis of the March 1999 Berlin Agenda 2000Agreement
Binfield J., T. Donnellan and K. McQuinn (2000). Paper presented to the Agricultural Economics Society of Ireland. Dublin May 31st.

Future Developments in Policies and Markets, Including Exchange Rates
Binfield J., T. Donnellan and K. McQuinn (2000). Proceedings Outlook 2000: Medium Term Analysis for the Agri-Food Sector. Dublin.

Dairy Sector Outlook for Ireland
Donnellan, T., W. Fingleton, M. Keane, P. Enright, D. and O'Connor, (1998) Proceedings Agri-Food Economics Conference 1998. Teagasc, Dublin.

Agricultural Incomes Outlook for Ireland
McQuinn, K. and B. Riordan. (1998) Proceedings Agri-Food Economics Conference 1998. Teagasc, Dublin.

World Market Outlook to 2007 and Agenda 2000
Young R. (1998) Proceedings Agri-Food Economics Conference 1998. Teagasc, Dublin.

For more information and a comprehensive list of publications, including full text of many of the reports access the FAPRI-Ireland website at http://www.tnet.teagasc.ie/fapri