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Medium-Term Review: 1991-1996

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JOHN BRADLEY JOHN FITZ GERALD DANIEL MC COY



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The editors remain solely responsible for the way in which the model was used and for the content of this publication.

SUMMARY

MAIN FEATURES

Our medium-term forecast for the period 1991-96 is for a pattern of resumed, steady growth in GNP, after a temporary slow-down this year. The average rate of growth should be in the region of 3.5% per annum, a slower growth than was anticipated prior to the downward revisions of the prospects for the world economy made over the last two years. In particular, the rise in German interest rates, consequent on unification, has reduced the prospective Irish growth rate in the medium-term by 0.5%.

This level of modest, steady growth will sustain a surplus on the balance of payments of about 2% of GNP, due to the high export orientation of Irish industry and the maintenance of recent gains in cost competitiveness. A high level of profit outflow will also continue, exerting a downward influence on the value of GNP. Payments of interest on the foreign-held component of the national debt will only increase slightly, and will fall as a percentage of GNP. Factor income flows from the build-up of Irish-owned foreign assets will increase, and the net effect of all three factor income components of the balance of payments will not impart a downward bias between GNP and GDP growth, as it did in the 1980s.

When privatisation receipts are taken into account, the exchequer borrowing requirement, at a level of 2% of GNP in 1990, will stay unchanged as a proportion of GNP this year, but will rise to about 3% next year. Thereafter, it will decline slowly, but will still be in deficit to the extent of almost 1.5% of GNP by 1996. A gradual reduction in the debt/GNP ratio is forecast to continue, but it is likely that the stated target of 100% by 1993 will not be reached until one year later, and that the ratio will still be above 90% by 1996.

By any standards, Ireland's record of low wage and price inflation of recent years is impressive. We forecast that price inflation will continue at a low level of under 3% per annum for the next five years, driven by a relatively stable world inflation picture and the likely stability of the Irish pound within the EMS. However, wage inflation is likely to pick up slightly from the very low rates that held over the 1987-90 period of the *Programme for National Recovery*. Rates for the period 1992-96 are likely to average just over 5% per annum, a value not likely to compromise seriously recent competitiveness gains.

Total employment will grow by about 50,000 jobs over the five-year period, or by less than 1% per annum. The growth in employment might have been closer to 80,000 were it not for the high interest rates consequent on German unification. Against a background of a rapid

natural growth in the labour force, and lower net emigration, due to a depressed UK labour market, this will result in a rise in the unemployment rate from its 1990 level of 14 percent of the labour force to a sustained level of 16%. There is little prospect that it will fall below that level for the next five years.

SECTORAL DETAILS

This is the first issue of the *Review* that makes use of the greater sectoral detail of the latest version of the ESRI economic model which permits us to examine the performance of the different sectors in the economy where production activities occur.

Industry was the driving force of the recovery from the recession of the 1980s. Over the period 1987-90, activity in all sub-sectors grew rapidly, driven by a very buoyant world economy (particularly in the UK), and the beneficial effects to confidence of the fiscal adjustments of 1987-89.

The medium-term prospects in the important *high-technology* sector of manufacturing are for continued growth, but at a lower rate than the exceptionally high levels enjoyed in the last two decades. The *traditional* sector of manufacturing, after its traumatic performance during the 1980s recession, will continue its strong recovery, benefiting particularly from Ireland's more competitive climate. The *food processing* sector, however, is likely to show a fall in employment with very little change in output, as the reforms of the CAP constrain agricultural production and rationalisation of plants proceeds. In aggregate, employment growth of 20,000 is expected in manufacturing over 1991-96.

Unlike manufacturing, growth in the building and construction sector is determined by domestic demand. The infrastructural programmes being carried out under the Community Support Framework (EC Structural Funds) will also continue to boost construction activity out to 1993 and to sustain it thereafter, on the assumption of a renewed CSF-type programme. However, growth in this sector is likely to display cyclical behaviour, typical of previous recovery periods. Employment is expected to grow by about 11,000 over the period 1991-96.

The market services sector of the economy has been growing in importance in all developed economies as well as in Ireland. Three main sub-sectors are identified in our analysis: distribution (wholesale and retail), transport and communication, and other market services (professional, personal, financial).

Developments in the EC *Single Market* process (1992) are likely to cause some restructuring within distribution, and to slow growth. While demand for transport and communication services is likely to continue to grow rapidly, employment growth may be more modest due to the likely restructuring of the postal system. The highest growth will arise in the area of professional, personal and financial services. In aggregate, employment growth of about 30,000 is expected in market services over 1991-96.

The remaining two sectors, agriculture and the public sector, are greatly constrained in their possibilities for growth. Agriculture will be subject to major reform of the CAP and this issue is explored fully in a separate article in this *Review*. Employment is expected to continue to fall, and agriculture is expected to shed almost 25,000 jobs over the period 1991-96. The continuing constraints on the public finances are almost certain to restrict public sector expansionary initiatives into the medium term, and the likely jobs growth in the public sector (health, education, public administration) is unlikely to exceed about 10,000.

BACKGROUND ASSUMPTIONS

Underlying our central forecast are a set of assumptions concerning key external variables and the stance of domestic policy. In the case of the world economy, we are forced to rely on the work of a number of major international organisations (such as the OECD, EC, IMF) and private international forecasting agencies.

The behaviour of the world economy is the single most important influence on the potential for Irish growth. Here, our assumptions were conditioned by two key factors: the slow-down and recession in the US and UK economies, with their knock-on effects on the rest of the world, and the events in Eastern Europe (in particular the unification of Germany).

The severity of the UK recession, in particular the rise in unemployment, still has serious consequences for Ireland, even though trade diversification and our long-term membership of the EMS have attenuated Irish-UK inter-dependence. In addition, the dominance of US multinational investment in Ireland makes us particularly sensitive to developments in the US economy, over and above the dominance of the US in other world markets. We assume that the UK and the US begin to pull out of recession in 1992, and that annual real growth in OECD industrial output will be just under 2.5% from 1993-96. Inflation in the UK and the US is also likely to moderate towards an annual rate of about 3% in the latter part of our forecast period. Our added assumption that the Irish pound remains essentially linked to movements in the DM will ensure that Ireland too enjoys continued low inflation.

The situation with respect to developments in the re-unified Germany are at once more serious and more difficult to forecast. The imperative of bringing previous East German regions up to the same level of development as the Federal Republic will place enormous political and economic strains on Germany and on the entire European Community. German fiscal policy will need to be expansionary in order to redevelop the Eastern *länder*, necessitating a massively increased level of public expenditure and some considerable

raising of taxes. This will cause the Germany economy to grow faster than most other OECD economies, bring about large exchequer deficits, and has already caused the Germany balance of payments to go into deficit.

Consequently, we assume a growth rate of over 4% per annum on average for the period 1991-96, with some slight rise in the rate of German inflation to 4% in 1992, falling back to 3% thereafter. The likely policy of high interest rates pursued by the Bundesbank will keep nominal rates at 8% or above out into the medium term.

For domestic policy, we attempt to interpret the official statements and hints about the likely course of public expenditure and taxation planning for the immediate future, and implement a process of "policy indexation" further out into the medium term (i.e., where future policy is maintained at fixed real levels).

LONG-TERM PROSPECTS

In our *Review* we take a somewhat provocative look at a possible long-term scenario for the Irish economy out to the year 2000. Given modest steady world growth and a domestic policy of indexation, the scenario points clearly to a serious long-term problem in the Irish labour market.

Ireland inherits a rate of growth at the upper end of that forecast for the OECD area, together with a low and stable rate of price inflation, a maintained modest surplus on the balance of payments, elimination of the EBR and a debt/GNP ratio of about 70 per cent of GNP. Nevertheless, the net annual addition to total employment runs at only 10,000, well below the natural growth in the labour force. This results in resumed emigration (rising from 10,000 in 1992 to just under 40,000 per year by 2000), which serves to lower the rate of unemployment by the year 2000 to the same value it had in 1990, i.e., 14 per cent of the labour force.

In effect, this is the labour market scenario outlined by the National Economic and Social Council in their report *A Strategy for the Nineties*, and declared to be "entirely unacceptable". Our *Review* concludes with a critical examination of how policy and behaviour changes are needed in order to prevent this *ex ante* scenario becoming an *ex post* reality.

POLICY IMPLICATIONS

Any solution of the ills identified in the scenario to the year 2000 must be addressed under three major headings:

- (a) The relationship between employment, unemployment, competitiveness and pay;
- (b) The nature of the constraint facing public sector initiatives, and how these constraints must be addressed;
- (c) The scope for long-term development policies to address underlying structural problems

We see incomes and competitiveness policies as going to the core of how a faster rate of employment creation might be encouraged. If the benefits of productivity rises are devoted entirely to raising the real wages of those in employment, then the scenario points

TABLE 1. : Central Forecast - Major Aggregates

	1988	1989	1990	1991	1992	1993	1994	1995	1996
GNP % Change	1.4	5.0	6.1	2.0	3.7	4.3	3.3	3.6	3.7
Balance of Payments, % of GNP	2.3	1.8	2.9	1.9	2.0	1.8	2.1	1.9	1.9
Exchequer Borrowing Requirement, % of GNP	-3.3	-2.3	-2.0	-1.9	-2.9	-2.6	-2.2	-1.9	-1.4
Debt / GNP Ratio	130.4	119.4	111.8	108.4	105.6	101.8	99.5	96.4	92.6
Total Employment (000)	1091	1090	1120	1123	1136	1151	1158	1167	1174
Unemployment Rate %	16.7	15.7	14.0	15.8	15.9	15.7	16.0	16.0	16.0
Consumer Prices %	2.5	3.9	2.9	2.7	2.4	2.6	3.0	3.1	3.1

FIGURE 1
Real GNP Growth Rate

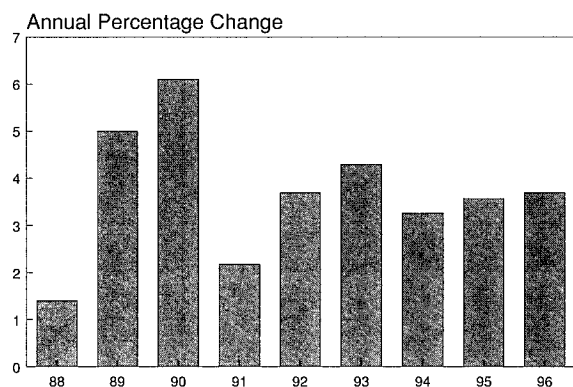


FIGURE 2
Price and Wage Inflation

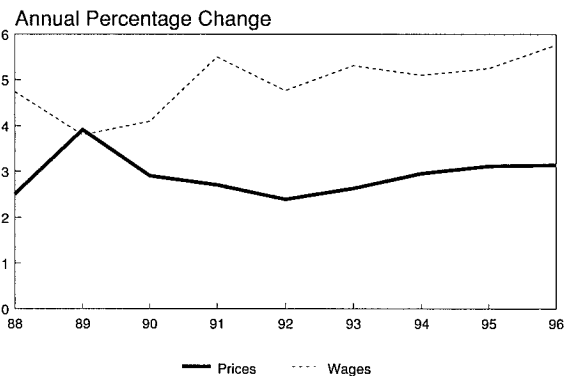


FIGURE 3
Unemployment Rate

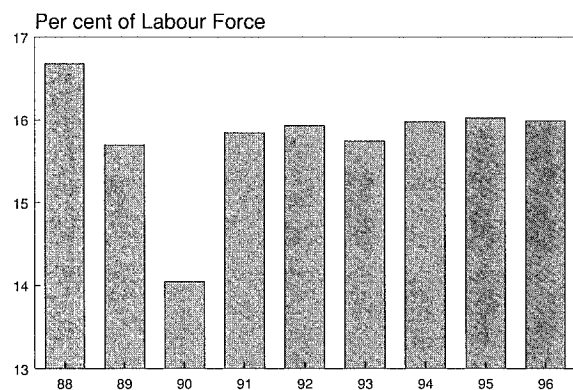


FIGURE 4
Balance of Payments Surplus

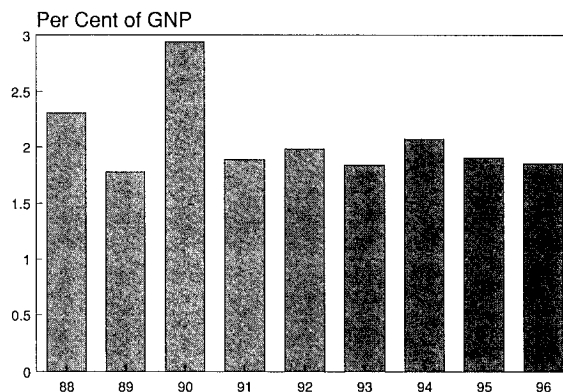


FIGURE 5
Exchequer Surplus

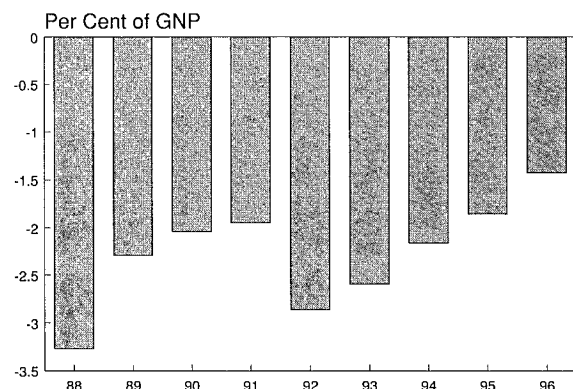
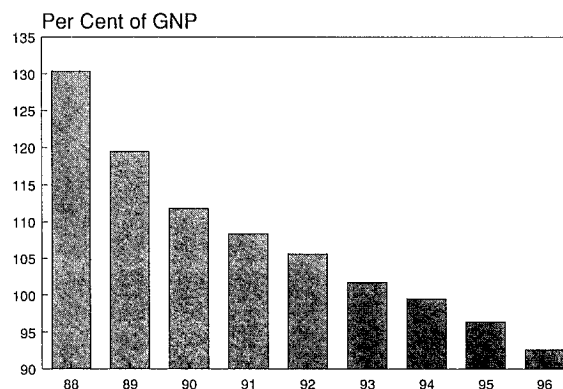


FIGURE 6
Debt/GNP Ratio



to the likely consequences: low employment, enduring high unemployment and emigration. However, if a virtuous circle of competitiveness, investment, growth and employment can be brought about by more rational and socially desirable evolution of wages and costs, then the prospect opens for a transition towards a high employment, high living standard society.

In this respect, it is disturbing that, at present, rising public expenditure is being used partly to fund higher wage increases in the public sector relative to those in the market sector. This action militates against the stated aspiration of public policy to reduce the rate of unemployment in the long run, and will undoubtedly bring pressure to bear on trades unions to seek higher wage increases in the market sector than might otherwise have applied.

The central danger of Ireland's high level of public debt is that movements in world conditions can trigger disruptive corrective measures, as occurred in the early 1980s. The minimum requirements for public policy on indebtedness are a *rapid* reduction of the debt/GNP ratio to under 100 per cent, mainly on prudential grounds, followed by continuous, if gradual, reduction thereafter towards average EC levels of 50-75 percent.

Finally, we stress the valuable contribution that the National Economic & Social Council has made to the search for longer term policies on development that will both attempt to push the Irish economy towards a path of faster growth, and ensure the maximisation of employment creation. We draw attention to the need for a pragmatic quantification of the likely benefits of these policies, and an assessment of how likely they are to make inroads into our endemic level of unemployment.

INTRODUCTION

“πολλων ταμιας Ζευσ ’εν ’Ολυμπω
πολλα δ’ ’αελπτως κραινουσι θεοι.
και τα δοκηθεντ’ ο’υκ ’ετελεσθη,
των δ’ ’αδοκητων πορον η’υρε θεος.”*

In classical times in Greece it was traditional to consult the Delphic oracle before commencing any major new undertaking. This consultation was no mere forecasting exercise but took on the nature of a quasi-religious experience. No doubt the oracle learnt a lot of secrets from this process and improved her forecasts as a result! We make no such exalted claims for this *Review*.

No more than the oracle, what we have tried to do is to learn from past experience and to identify the problems and possibilities for the Irish economy in the 1990s. Chapter 2 of this *Review* looks at our experience over the last fifteen years. This analysis of past policies and their effectiveness provides the essential basis for any forecast of the next five years.

While the forecasts which we provide are useful to a wide range of organisations and individuals in planning for the future, everyone recognises the uncertainty which must attach to them. However, judgements about the future must be made so, in Chapter 3, we examine developments in the outside world. We consider what the likely environment for the Irish economy will be over the period to 1996 and what are the major factors giving rise to uncertainty about this future.

Having established a view as to the external economic environment Ireland faces, we then use the ESRI Medium-Term Model of the economy to develop a consistent central forecast for the period 1991-96. The first of a series of separate articles in this *Review* by Bradley and Fitz Gerald gives a non-mathematical description of how the model works. It outlines the key mechanisms in the model and explains the logic behind its specification.

In preparing a forecast, the first task is to decide on a set of assumptions concerning the key variables driving the economy. For example we look at growth in Germany and the UK, German interest rates, UK unemployment, domestic fiscal policy, etc. The model is then applied to these assumptions and a forecast is

produced. It is at this point that the authors' judgement is applied to the model's results. Extensive adjustments are made to take account of additional information concerning the likely behaviour of the economy and to allow for factors which the model can not take into account.

In this *Review* the forecast for 1991 is taken directly from the spring issue of the *Quarterly Economic Commentary*. The central forecast for the next five years is described in Chapter 4. It suggests that the Irish economy can look forward to steady, if unspectacular, growth in GNP over the 1990s. However, the unemployment rate will continue rising up to the middle of the decade posing the major problem for economic policy in the medium term. The state of the public finances, which merited less attention in the last *Review* in 1989, is again a cause for concern in the immediate future. Unless policy is changed the borrowing requirement may actually rise in the next two years.

In Chapter 4 we also use the model to examine how our forecast would be modified by changes in our assumptions about EC interest rates and economic growth in the USA and the UK. The model allows us to explore in a consistent manner the full effects on the economy of such shocks to the external environment.

In many ways more important than our forecasting role is the task of identifying the problems and possible obstacles to development which Ireland may face in the medium to long term. There is a danger that the immediacy of current problems may act as blinkers on our vision of the future. What we wish to do in this *Review* is to raise our own vision slightly, to see these problems from the perspective of a wider time frame. Chapter 5 considers the problems that will be faced by the Irish economy to the end of the decade and discusses how policy should be modified to deal with them.

The major theme of Chapter 5 is the need to act on the supply side to increase the long-term productive potential of the economy. This chapter examines some of the themes in the NESC report *Strategy for the 1990s* which is the only approach capable of producing a lasting increase in employment over and above that which will occur under existing policies. It considers different areas where efficiency may be increased and competitiveness improved.

* Euripides *Medea*:
Many are the fates which Zeus in Olympus dispenses;
Many matters the gods bring to surprising ends.
The things we thought would happen do not happen;
The unexpected god makes possible;

Two areas where Ireland faces special problems over the next decade are considered in separate articles. An article, by Fitz Gerald and O'Connor, looks at the likely effects on Ireland of one approach to reforming the Common Agricultural Policy (CAP). This article suggests that the reform package examined could result in a substantial reduction in GNP in the medium term of the order of 1 to 1.5 percentage points. The effects would also be felt beyond the agricultural sector.

An article by McCoy considers Irish policy on acid rain. It examines the likely impact on the economy of different policies to deal with the problem and suggests that the current policy may be seriously flawed. It suggests that a new multilateral approach is called for and it shows that a transfer of funds to Eastern Europe could prove more efficient at meeting what appears to be the government's objective than the policy currently being implemented.

The last article in this *Review* by Barry provides a review of the literature on the problem of slow employment growth in Ireland. It argues that while conventional demand-side effects of policies have adversely affected employment growth in the past, the supply side of the economy must be seen as the engine of growth. The paper further argues that the impact of structural change on unemployment needs to be researched more fully.

The Record of the *Medium-Term Review*

This is the fourth *Medium-Term Review* to be published since the series began in 1986. While humbling for the authors, it is useful to consider the forecasting record of the *Review* over the period both to improve the quality of future forecasts and to understand the likely margins for error in the major aggregates. Because the *Review* provides forecasts five years ahead this is a much more stringent test than that normally applied to short-term forecasts.

Table 1.1 shows the forecast for the average growth in GNP from the last three *Reviews*. These forecasts are compared to the average growth over the same period using historical figures, where available. For 1991 and later years the latest forecasts from this *Review* are used and compared to the earlier ones.

While at the time of their publication the first two *Medium-Term Reviews* were considered to be unduly optimistic, in fact, they underestimated the growth in the economy by between 0.75% and 1.0% a

**TABLE 1.1: Comparison of Forecasts
Average Annual Growth Rate**

	Forecast Period	Forecast %	Latest Estimate %
<i>Review 1986</i>	1986-91	2.46	3.24
<i>Review 1987</i>	1988-92	2.64	3.69
<i>Review 1989</i>	1989-94	4.88	4.10

year for the forecast period. The 1989 *Review* erred in the other direction. While it correctly forecast the very rapid growth in 1989 and 1990, it failed to predict the 1991 slow-down. In addition, it showed the underlying growth rate in the economy in the 1990s as being around 4% a year, about 0.5 percentage points above the current forecast.

In the case of the slow-down in 1991 the last *Review* took too optimistic a view concerning the trend of public policy in the USA and the UK. Both these economies failed to deal with the problems apparent in 1989 and recessions ensued. Their depth was magnified by unexpected developments in the Middle East. The forecast large fall in the Irish savings ratio also failed to materialise, partly because interest rates were higher than forecast. The uncertainty concerning movements in the savings ratio continues and this must be a priority for further research.

As explained later, another reason for the reduction in the forecast potential growth in output in the economy lies in the changes in Eastern Europe. The effects of German unification have raised interest rates in the EC. Failure to predict the major upheavals in Eastern Europe was not surprising and was shared with every other forecasting body.

While the margin of error in the forecasts for the average growth in GNP in previous *Reviews* was between 0.75% and 1.0%, the possibilities of error on a year by year basis are greater. The last *Review* was fairly successful in forecasting growth in 1989 and 1990 but it failed to predict the turning point in 1991 when the slow-down occurred (Table 1.2). The first two *Reviews* were correct in predicting that the Irish economy would show a reasonable recovery from the recession of the 1980s but were not very accurate in forecasting the timing of the recovery. This highlights the fact that while medium-term forecasting is useful in predicting broad trends, it is likely to prove unreliable on the precise timing of developments in the economy. This *Review* should be read with this *caveat* in mind.

TABLE 1.2: Comparison of Forecasts for GNP Growth Rate

	1986	1987	1988	1989	1990	1991	1992	1993	1994
<i>Review 1986</i>	2.5	3.3	3.5	3.0	3.0	-	-	-	-
<i>Review 1987</i>	-	-	-0.4	3.0	3.3	3.7	3.6	-	-
<i>Review 1989</i>	-	-	-	4.0	7.1	5.6	4.6	4.8	3.2
<i>Review 1991</i>	-	-	-	-	-	2.0	3.8	4.3	3.3
Latest CSO Estimate	-1.2	5.0	1.4	5.0	6.1	-	-	-	-

RECESSION AND RECOVERY: IRELAND IN THE 1980s

2.1 INTRODUCTION

Since the dust has scarcely settled on the 1980s, it is probably premature to attempt to characterise this recent period in any definitive way. However, history will probably interpret Ireland of the 1980s in terms of two factors:

- (a) the very deep world recession associated with the OPEC-II price rises at the beginning of the decade and;
- (b) the manner in which domestic policy makers attempted to contain and reverse the public debt consequences of the extravagances of the previous decade against a background of the more buoyant world growth of the late 1980s.

Only now do we have data sufficiently complete (if not yet totally reliable) to give us a picture of how the economy behaved during the 1980s, in particular during the crucial latter years of recovery. Our objective in Section 2.2 is to present an overview of what actually happened and to suggest some possible explanations for the strange roller-coaster behaviour of many measures of Irish economic activity: the violent gyrations of growth in GNP; the rapid decline in inflation; the switch from a chronic balance of payments deficit to a sustained, if modest, surplus; the virtual elimination of the exchequer borrowing requirement; and the rapid rise in unemployment to a seemingly ever-enduring high level.

As well as suggesting factors which explain the performance of the economy in a qualitative sense, we also attempt to quantify the role played by these factors in causing recession and recovery during the 1980s. In a very stylised way, three main elements can be identified in such analysis:

- (a) the direct and indirect effects of the world economy, over which Irish agents had no effective control;
- (b) domestic policy actions, which are determined, at least to some extent, by deliberate and explicit choices of Irish policy makers, and finally;
- (c) the manner in which agents in the private sector react to stimuli from world and domestic policy influences.

In Section 2.3 we explore the role of "world" factors in the behaviour of the Irish economy during the 1980s, while in Section 2.4 we examine the role of domestic policy actions. In Section 2.5 we carry out some counter-factual analysis of Ireland's recent period of recovery, focusing specifically on the years 1987-90. These counter-factual experiments attempt to re-play history, but changing certain crucial assumptions, in an

effort to understand the driving forces in the economy. Alternative explanations of this recovery have also been offered and we comment on these, comparing and contrasting them with our own analysis.

Our analysis in these three sections is conditioned by the manner in which we handle the third crucial element above, i.e., the behavioural response of the private sector. Here we are on more controversial ground in that we make use of the framework of analysis contained in the ESRI Medium-Term model of the economy, an introductory description of which is given in a separate article in this *Review*.

There is no such thing as a perfect and comprehensive economic model. Nevertheless, the ESRI model is in the public domain, has been extensively used and tested in two previous *Reviews* and has a structure that is, we believe, intuitively plausible and coherent. Hence, its use in carrying out counter-factual analysis and a decomposition of the major influences operating during the 1980s is of some relevance. It is also important to note that the key focus of the ESRI model is on the production (or supply) side of the economy, an area that is crucial to understanding Irish economic behaviour in the medium term, but one that is somewhat neglected in quantitative research on Ireland and elsewhere.

Central to our analysis of the causes of recession and recovery in the Ireland of the 1980s is the assumption that the reactions of the private sector to world and domestic policy stimuli has remained predictable within the framework of analysis used by the ESRI model. In fact we anticipated at least two important changes in behaviour for the late 1980s, these years being outside the range of data used to calibrate the model; the first associated with the determination of wage increases and the second with consumer behaviour.

In the case of wages, it seemed initially likely that the conjunction of adverse labour market conditions and the crisis in the public finances in the mid-1980s might have led to a significant change in the manner in which trades unions and employers settled on the three-year wage deal negotiated as part of the *Programme for National Recovery*. In fact, no such break in behaviour was found, and the model continued to explain the main elements of wage bargaining throughout the late 1980s, as we describe below.

In the case of private consumption expenditures, the simple model we use does indeed systematically underpredict the growth in consumption for the recovery period 1988-90 (equivalently, it overpredicts the savings rate). Since this is signalling a change of behaviour

which we do not yet fully understand, an *ad-hoc* adjustment was made to the model to force it to track recent consumption growth.

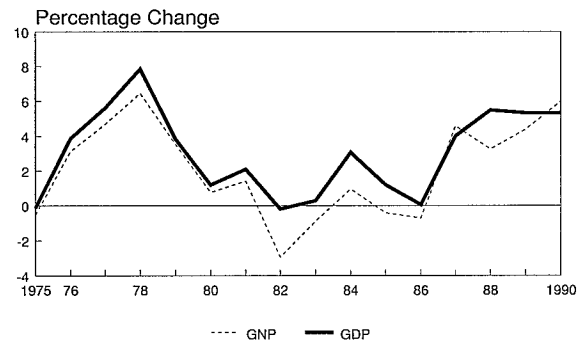
Our examination of the 1980s, particularly the latter part, is very relevant in evaluating our prospects for the 1990s, the presentation of which later forms the central element of this *Review*. In Section 2.6 draw together our main conclusions on the 1980s with a view to setting the scene for the detailed forecasts of the period 1991-1996 (Chapters 3 and 4), and our more speculative exploration of the likely prospects for the latter part of the decade (Chapter 5).

2.2 OVERVIEW: 1980-90

2.2.1 Output and Expenditure

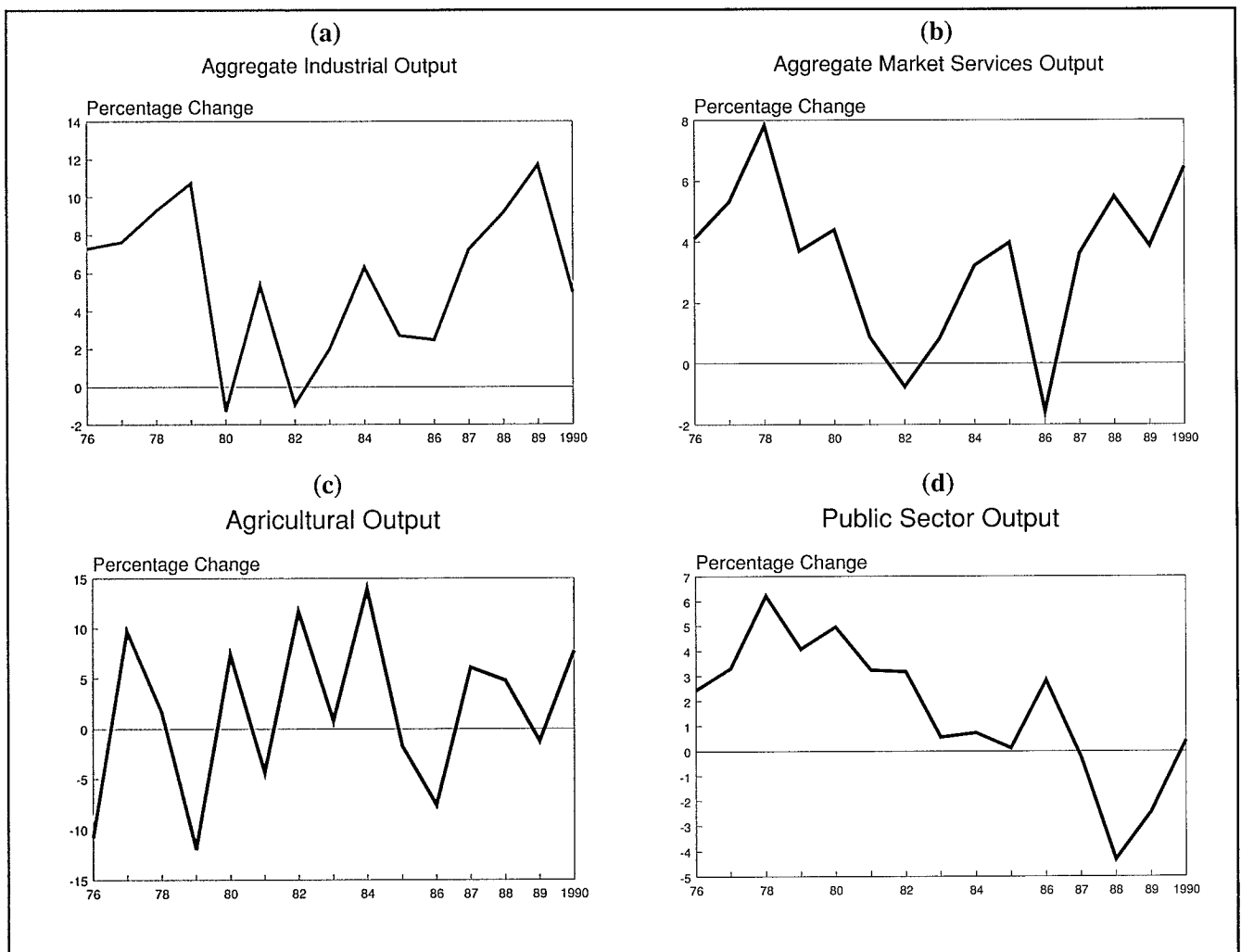
The broadest aggregate measure of production activity in the economy is Gross Domestic Product (GDP), being the summation of output in all the producing sectors. In Figure 2.1 we show the growth rate of real GDP for the 1980s, using the expenditure-based CSO measure. The dismal and erratic performance of the first half of the decade is only too apparent, as is the robust recovery from 1987 out to 1990.

Figure 2.1
Aggregate Real Growth
Gross National & Domestic Product



However, for Ireland during the 1980s, performance, even judged by this GDP measure, was misleadingly flattering. A sizeable fraction of domestic product was required to fund both interest payments on the foreign component of the national debt and profit repatriations from foreign-owned branches of Irish-based multi-nationals. These two outflows from the economy grew

Figure 2.2
Sectoral Output Growth



rapidly during the 1980s and were much larger than any inflows of income from abroad to Irish residents arising from ownership of foreign assets. Subtracting the real net outflow abroad from GDP, the resulting real Gross National Product (GNP) growth rate is shown as the dotted line in Figure 2.1.

Further understanding of the growth of GDP can be obtained by looking at the sectors of the economy which produce it. In Figure 2.2 (a-d) we show the growth rate of output in four main sectors at factor cost (i.e., excluding taxes and subsidies): industry, market services, agriculture and non-market services. The two dominant producing sectors are industry (over 42 per cent share of total GDP by 1990) and market services (35 per cent share), while the share of agriculture declined over the 1980s to about 9 per cent by 1990.

The pattern of industrial growth reflects (indeed, dominates) the aggregate picture: a slow-down during the first half of the decade, followed by a very vigorous recovery over the period 1987-90. A similar pattern is seen in the performance of market services, although the recovery phase is somewhat attenuated.

The erratic behaviour of agriculture (with some remarkably good years - 1982 and 1984 - and some very bad years, often weather related - 1985-86 and 1989) is fairly typical of any primary producing sector. The small share of agriculture in the economy (9 per cent by 1990 compared with 15 per cent in 1960) means that the rest of the economy is somewhat less sensitive to shocks originating in agriculture than was the case, for example, in the 1960s.

Finally, Ireland entered the 1980s with a greatly increased level of public sector output and employment and consequently, of expenditure on public goods and services (also referred to as "non-market" services). Many of the subsequent problems with the public finances can be inferred from the behaviour of public sector output. Even by 1982, when aggregate GNP growth was negative, real public sector activity was still growing by over 3 per cent. Over the period 1983-87, the real level of public services remained relatively static (with a temporary rise in 1986). The cuts in the levels of services (initiated after the 1987 general election) were concentrated in the years 1988-89 (-4.3 and -2.5 per cent respectively), with service levels growing by a modest half per cent in 1990-91.

In summary, any explanation of the low and erratic growth in aggregate GDP over the 1980s should be based on the mechanisms of growth in the producing sectors: low growth in industry for the period 1980-86, followed by a rapid recovery; a similar pattern in marketed services; erratic growth in agriculture, the causes of which have little connection with the non-agricultural economy; and a frozen real level of public sector services to 1987, followed by two years of real cuts. We now examine these mechanisms under two broad headings: the behaviour of the public sector and the behaviour of the private sector.

2.2.2 The Public Sector during the 1980s

The output measure of public sector activity (i.e., services of public administration, health and education) appears on the expenditure side of the national accounts as public consumption. Since funding public con-

sumption represents ultimately a burden on the rest of the economy (a burden that can only be delayed and increased by debt rather than tax financing), we show in Figure 2.3 the share of public consumption in the value of GNP. Starting at 20.5 per cent in 1980 (up from 14 per cent in 1970), this ratio stayed high during the first half of the decade, peaked in 1986 at 21 per cent, and declined to just under 18 per cent by 1990 as a result of job shedding in the public sector (Figure 2.4).

Figure 2.3

Share of Public Consumption in GNP

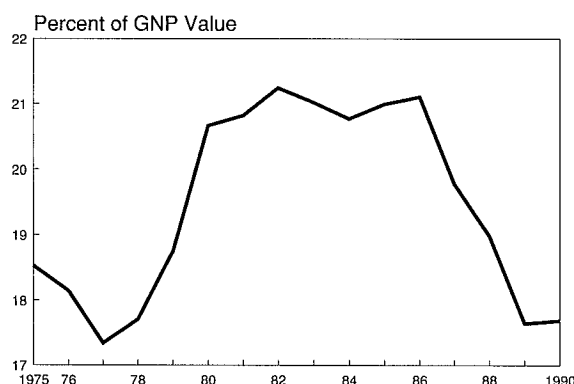
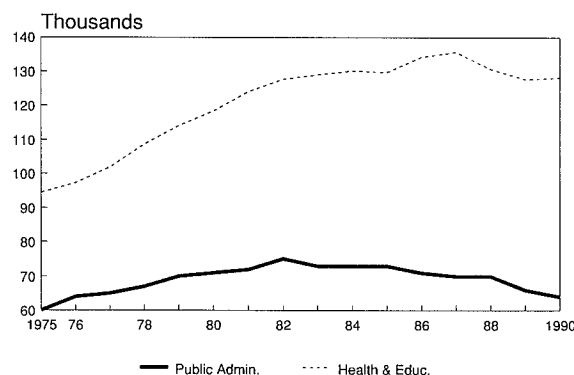


Figure 2.4

Public Sector Employment



The above ratio is a "narrow" measure of the size of the public sector in the economy. A wider measure consists of total public expenditure, obtained by adding public consumption, subsidies, current and capital transfers (such as debt interest payments, unemployment benefits and IDA grants to industry), and public investment expenditures (such as housing, roads, etc). In Figure 2.5 we show this "broad" expenditure measure as a ratio to GNP. It peaked at just under 56 per cent in 1985, and by 1990 had fallen back to under 46 per cent (it was 39 per cent in 1975).

While theoretically this expanded level of public expenditure could have been financed by raising taxes and keeping the exchequer borrowing requirement roughly in balance, in fact resort was made both to tax financing and to borrowing during the 1980s. Figure 2.6 shows the exchequer surplus (i.e., the negative of the borrowing requirement, EBR) as a proportion of GNP while Figure 2.7 shows total taxation revenue as a proportion of GNP.

Figure 2.5
Total Public Sector Expenditure
(Consumption, Transfers, Capital)

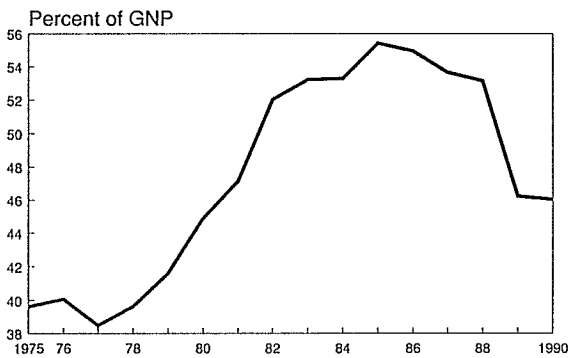


Figure 2.6
Exchequer Surplus
Actual Surplus and "Primary" Surplus

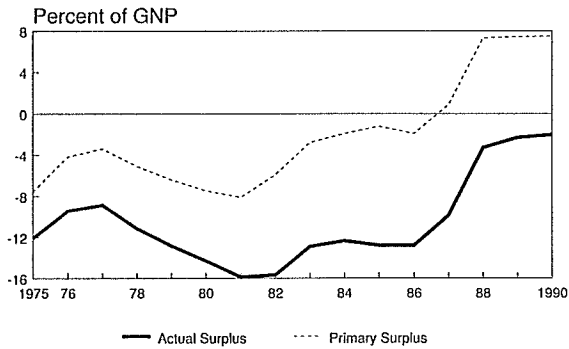
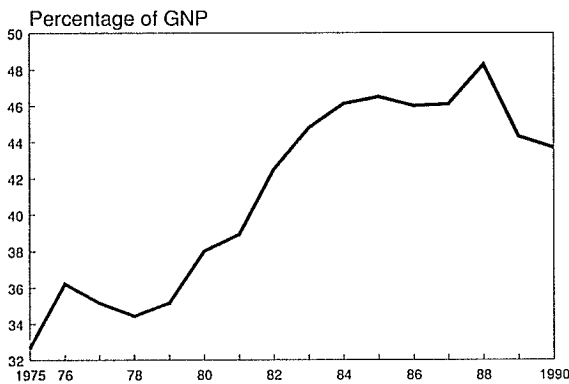


Figure 2.7
Total Tax Revenue



Financing the burgeoning EBR required the state to borrow both domestically and abroad, and the accumulated national debt as a proportion of GNP (the "debt/GNP" ratio) rose from just under 80 per cent of GNP in 1980, to a peak of over 137 per cent in 1987, and had declined to 112 per cent by 1990 (Figure 2.8). The high level of borrowing was further exacerbated by the rise in nominal and "real" interest rates (i.e., the "nominal" or actual rate corrected by subtracting the rate of inflation), movements in which are shown in Figure 2.9. In the previous Figure 2.6 we show the "primary" surplus (i.e., the actual exchequer surplus less interest

payments on the national debt), which became positive in 1987, and is now running at some 7 per cent of GNP, as against a continuing actual deficit.

Figure 2.8
Foreign & Domestic Debt Interest

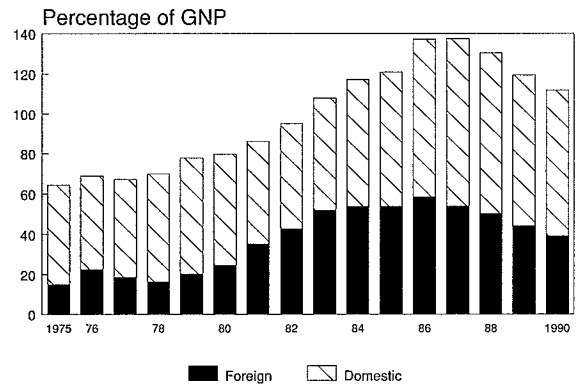
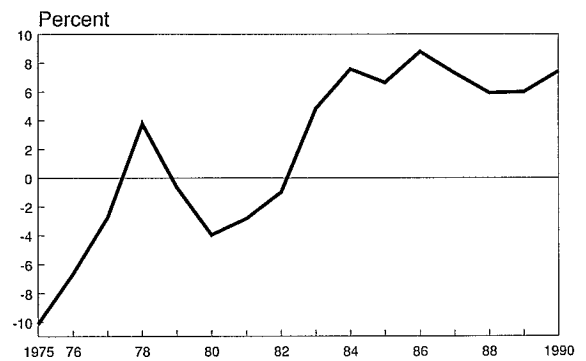


Figure 2.9
Real Interest Rate on National Debt
5-Year Bond Rate



A genuine fear existed during the early 1980s that the debt/GNP ratio might grow out of control, as increased borrowing was required to fund the growing interest bill, opening the possibility of default, debt rescheduling and externally imposed adjustment programmes. However, just as bad luck (in the form of the OPEC-II recession) exacerbated the debt problem at the end of the 1970s and into the 1980s, a combination of long-delayed domestic fiscal reform and a buoyant world economy eased the process of adjustment towards the end of the 1980s.

The bulk of the adjustment, in terms of expenditure cuts, took place in the years 1988-89. However, the budget of 1990 relaxed this process of adjustment, kept expenditure roughly constant in real terms, and provided only a modest reduction of the EBR from 2.3 to 2 per cent of GNP.

In summary, the experience of the 1980s brought home to Irish policy makers and people in general that public and private sectors are mutually linked and that a successful mixed economy requires an elusive balance to be struck between them in order to maximise aggregate growth opportunities. During the fiscal expansions of the 1970s and early 1980s this balance was upset and the requirement to reverse growth in the

inherited greatly expanded state sector in the leaner, more competitive, 1980s made an already difficult situation worse.

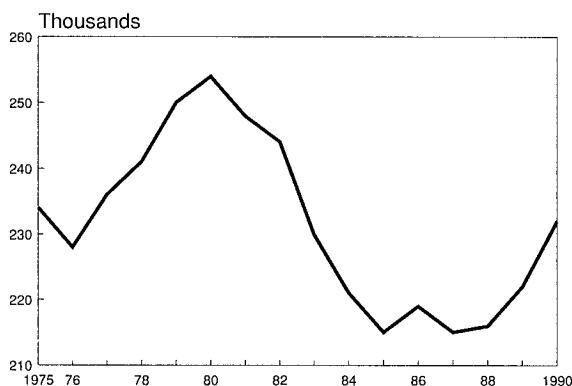
2.2.3 The Behaviour of the Private Sector

The analysis of the behaviour of the private sector is very different from that of the public sector discussed above. As shown in the separate article on the ESRI medium-term model later in this *Review*, we attempt to explain the behaviour of the private sector in terms of the outcome of purposeful directed actions.

So, for example, a private firm is assumed to produce a given output at minimum cost in terms of inputs needed. Hence, anything that reduces the desired production target (say, a decline in world demand), will cause a fall in the requirement for all inputs. Also, anything that raises the cost of labour (i.e., the wage rate) will *force* such a firm to use less labour in production. Firms that ignore these signals simply lose profitability and ultimately may go out of business.

A better understanding of the functioning of the private sector requires more detail than the above three-way breakdown into industry, market services and agriculture. Starting with industry, three sub-sectors can be distinguished: manufacturing, building and utilities. Figures 2.10 and 2.11 show employment in manufacturing and in building over the 1980s (employment in utilities - electricity, gas and water- was relatively constant at 14,000 throughout the decade). The shedding of 33,000 jobs in building and 39,000 in manufacturing over the years 1980 to 1987 are dramatic illustrations of the economic and social consequences of Ireland's recession.

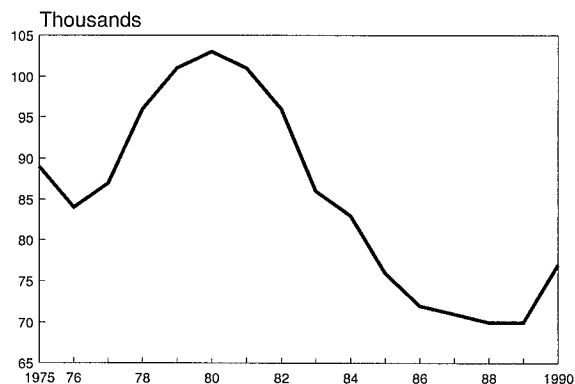
Figure 2.10
Manufacturing Sector Employment



Three further subdivisions of manufacturing are also relevant:

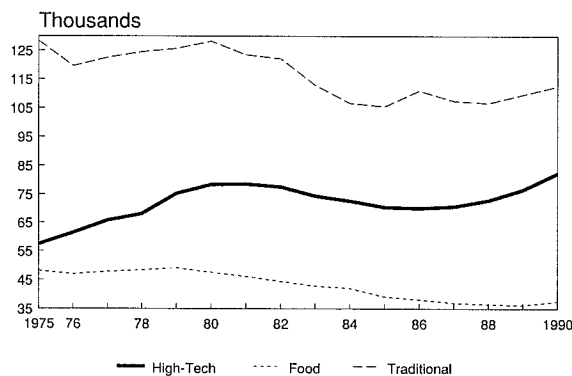
- a *high technology* sector (multinational, capital and R&D intensive, totally export oriented, repatriates its profits);
- a *food-processing* sector (mostly indigenous, linked to agriculture via its material inputs, moderately export oriented), and;
- a *traditional* sector (drink, textiles, wood, publishing, etc), which has a high dependence on the domestic and UK markets.

Figure 2.11
Employment in Building & Construction



Employment in these subsectors is shown in Figure 2.12, where it is apparent that the bulk of manufacturing job losses occurred in the traditional and food sectors.

Figure 2.12
Sectoral Employment in Manufacturing



The manufacturing sector component of industry has now become the key driving force of the Irish economy. It has a massive exposure to world trade: Figure 2.13 shows industrial exports as a proportion of gross national product. Given that exposure, there are two main determinants of manufacturing activity:

- the state of demand in the global economy, and
- cost competitiveness relative to trading partners.

In Figure 2.14 we show the Irish industrial growth rate compared with that in the OECD, where OECD growth is a good proxy for "world" demand. The combination of small size and high external exposure to the world economy means that Irish industrial prices are set largely in world markets and not as a mark-up on domestic industrial costs. Hence, the relevant measure of international competitiveness is cost-based, and in Figure 2.15 we illustrate how Irish wage rates moved relative to German and UK rates, on a common-currency basis. The erosion of competitiveness during the first half of the 1980s is apparent, a process that was not reversed until after 1985 relative to Germany and after 1987 relative to the UK. The period 1987-1990 is seen to be one where some of the previous losses were recovered.

Figure 2.13
Industrial Exports as Share of GNP

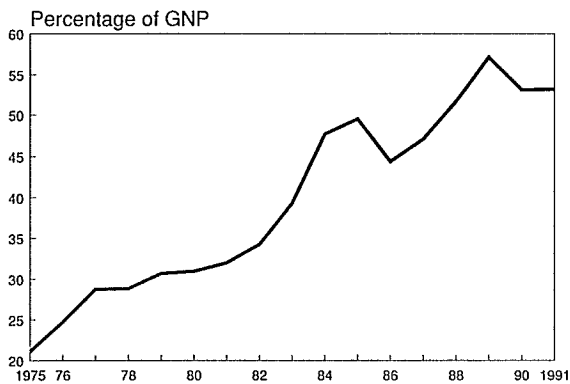


Figure 2.16
Balance of Trade and of Payments

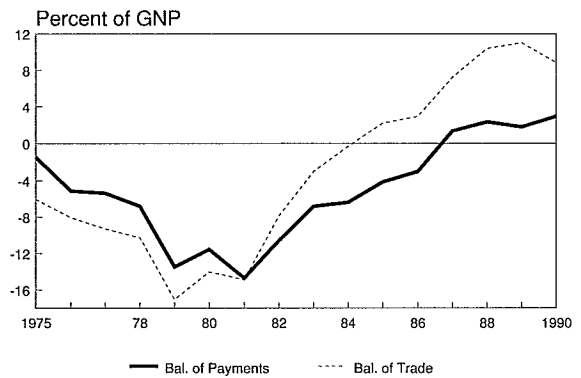


Figure 2.14
Irish & OECD Industrial Growth

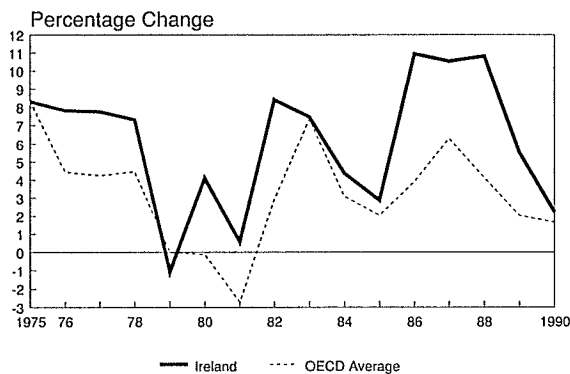


Figure 2.17
Balance of Payments
Current International Factor Flows

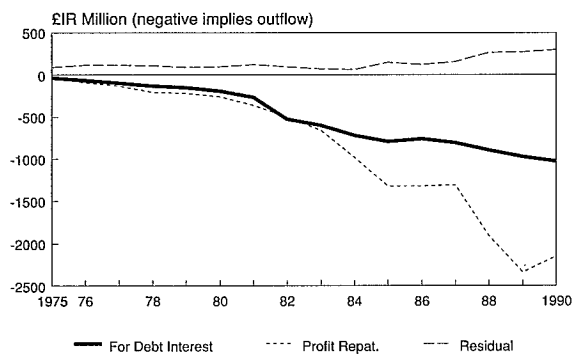
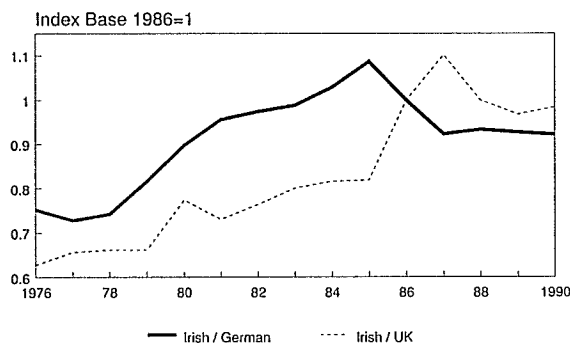


Figure 2.15
International Wage Comparison
Common Currency



The relatively strong performance of the manufacturing sector, combined with a weak domestic demand for imports (due to tight fiscal policy), led to the build-up of a large balance of trade surplus during the 1980s, thus reversing the deficits of the 1970s (Figure 2.16). However, the move to surplus on the balance of international payments took longer, due to the high and rising foreign debt and profit repatriation outflows, as shown in Figure 2.17.

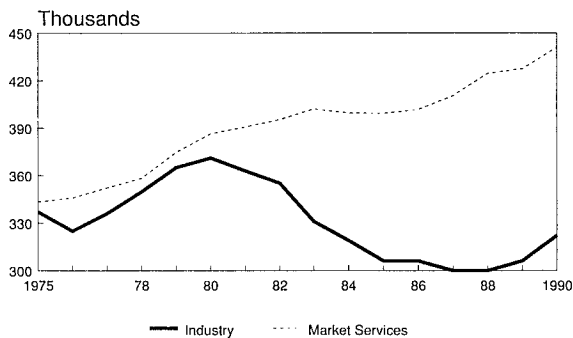
Turning to market services, this is now the largest sector of the economy in terms of employment. Unlike manufacturing, with the exception of tourism and some other services it is largely sheltered from direct exposure to world markets. Nevertheless, it thrives when the exposed industrial and agricultural sectors thrive and domestic demand is buoyant. In the short run it is broadly able to pass on higher costs in terms of higher prices.

Two offsetting forces operated on market services during the 1980s:

- a negative effect due to recession in the internationally trading sectors, and;
- a positive effect due to restructuring in industry, where many activities shifted from industry to services as, for example, originally in-house activities were replaced by bought-in services.

The resulting employment behaviour in industry and services is shown in Figure 2.18, where the relatively buoyant performance of services contrasts with the dismal performance of industry.

Figure 2.18
Sectoral Employment
Industry and Market Services

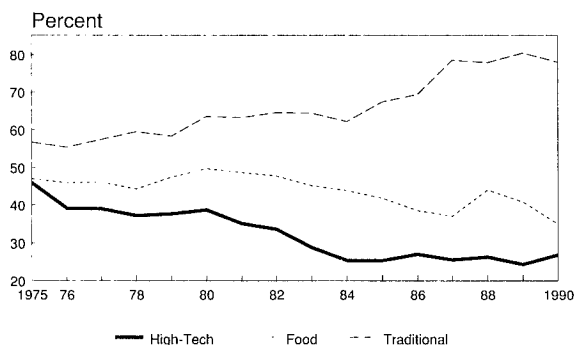


2.2.4 Wages, Prices and Profits

We have seen that Irish industrial output and export prices are largely determined abroad, and firms are unable to pass on higher domestic costs of production unless these cost rises are also being experienced abroad (i.e., as a general world-wide inflation). Hence, a firm's competitiveness will depend on its input costs and the efficiency with which it uses inputs (including non-price elements like design).

A key input cost consists of wages, particularly for "labour intensive" sectors. In Figure 2.19 we show the wage bill as a proportion of output (added-value) for the three-way breakdown of manufacturing. The traditional sub-sector is clearly the most labour intensive, with the high-technology sector being the least. However, given the way in which wage-rounds have been determined (or, at least, influenced) by economy-wide agreements, and the national coverage of trades unions, not surprisingly changes in wage rates tend to show a considerable similarity between sectors.

Figure 2.19
Wage Bill Share of Added Value
Manufacturing Industry



In Figure 2.20 we show the rate of wage inflation in total industry (the leading sector), together with the rate of consumer price inflation. Between 1980 and 1986, the growth rate of average annual earnings in industry fell from 18 per cent (in 1981) to 5 per cent (by 1986), and has remained at or below about 5 per cent per annum since then. To a considerable extent the process of disinflation was driven by world disinflation throughout

the 1980s (Figure 2.21). However, this process was assisted by the other downward pressures on wage demands, which we now examine, using the findings on wage bargaining discussed in the special article on the ESRI model later in this Review.

Figure 2.20
Price and Wage Inflation

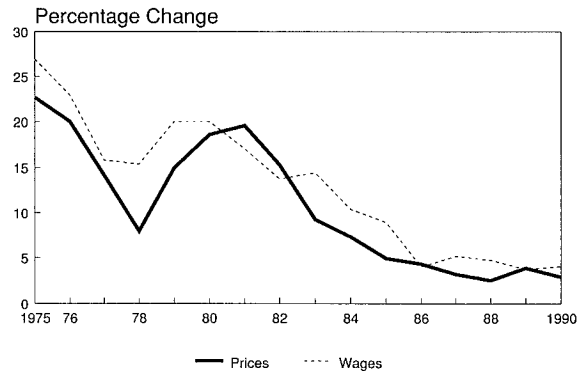
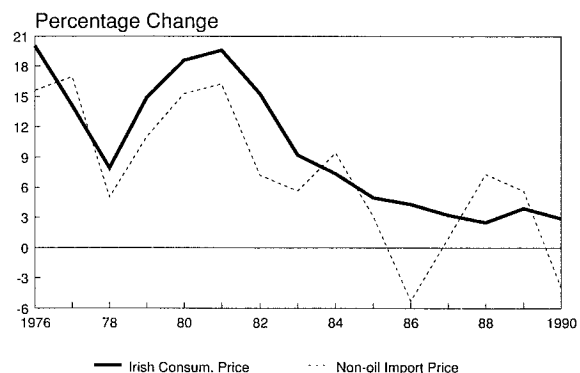


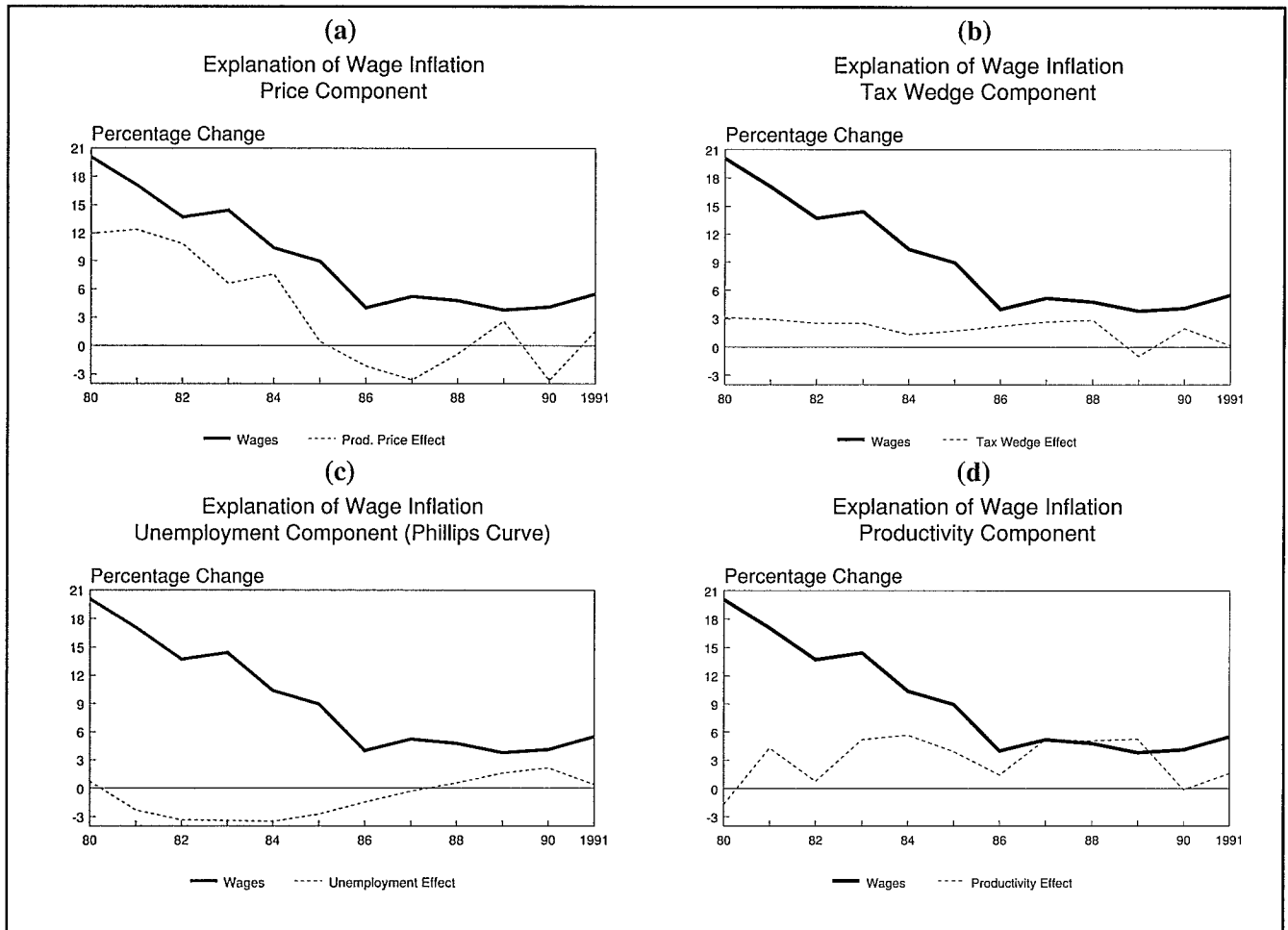
Figure 2.21
Irish and World Inflation Trends



In Figure 2.22 (a-d) we show the four elements determining wage inflation in the ESRI model, weighted so as to represent their short-run contribution to wage inflation. The solid line in each graph shows the actual path of wage inflation. The dotted line shows the effect on wage rates of the particular factor under investigation.

- (a) The biggest determinant is clearly *output price inflation*, which was falling globally as well as in Ireland. In the seven year period between 1980 and 1987, world price deflation appears to have reduced wage inflation from its high 1980 level of about 20 per cent by about 15 percentage points, other things being equal.
- (b) The *tax wedge* tended to add about 3 per cent to wage inflation each year from 1980 to 1988, with little or no net contribution thereafter.
- (c) The systematic rise in *unemployment* in the first half of the decade may have reduced wage inflation by a maximum of 3 percentage points per annum during the years 1982-1984. Once unemployment started falling after 1987, a modest annual upward pressure on wages was induced.

Figure 2.22
Determinants of Wage Inflation During the 1980s



(d) Finally, between 1981 and 1989, *labour productivity growth* tended to contribute an average 5 percentage points per annum to wage inflation. However, the sharp drop in productivity growth in 1990 and 1991 (from a trend growth of 4 per cent per annum to between zero and 2 per cent) served to depress wage inflation at the end of the decade.

In summary, the Irish price disinflation of the 1980s is almost totally explained by global price deflation and the relatively fixed exchange rate of the Irish pound within the EMS. The dominant force for wage disinflation also came from world price disinflation, particularly when expectations adjusted to the lower and more stable world inflation environment. The inflationary effects of tax increases in the years to 1987 tended to be offset by the deflationary effects of rising unemployment (the so-called "Phillips curve" effect). The fall in productivity growth towards the end of the decade was probably associated with the resumed growth of the more labour-intensive traditional manufacturing sector, together with a wider maturing of manufacturing after more than a decade of high-technology dominated growth.

The surprising finding is that the mechanism describing wage bargaining over the period of the 1960s and 1970s proved adequate and robust for explaining wage determination during what were widely perceived as innovative "corporatist" wage setting agreements of

the late 1980s. The stability and predictability of the world inflationary pressures probably assisted in the creation of the type of accurate expectations about the future which are so necessary in formulating and underpinning three-year pay deals. However, the benefits to the nation of the pay deal were probably associated more with industrial peace and stability rather than with strictly lower wage increases.

2.2.5 Employment and Unemployment

The number of people unemployed is the difference between total employment (or the demand for labour) and the total labour force (or the supply of labour). We have seen above that demand for labour fell precipitately during the years 1980-1987, and only picked up mildly by 1991. A net loss of over 33,000 jobs occurred over the period of the 1980s.

During this same period, the supply of labour grew by a little under 78,000. Part of this increase was simply due to an increase in the population of working age (14-64 years) of about 140,000, a slight rise in the participation rate (i.e., the proportion of the working age population actively seeking employment), both offset to a slight degree by a steady rise in numbers attending full-time education. However, a crucial factor moderating labour force growth (and hence unemployment) was the numbers leaving the country as emigrants

(Figure 2.23), a cumulative loss of over 240,000 between 1980-91, about two thirds of whom were assumed to be of working age.

Figure 2.23
Net Emigration

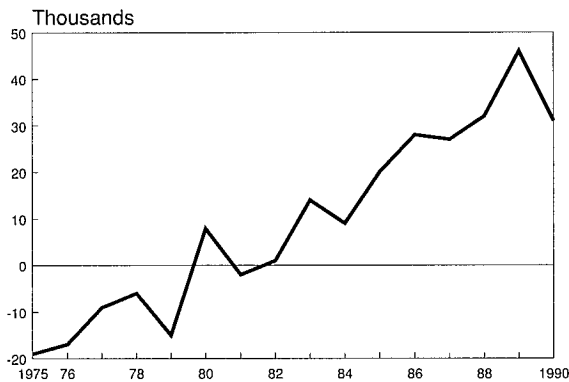
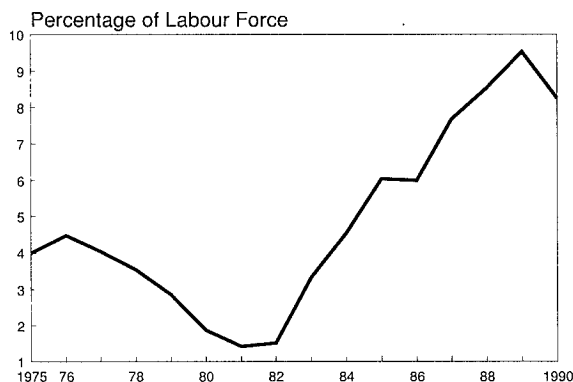


Figure 2.24
Unemployment Rate



The resulting rate of unemployment (numbers unemployed as a percentage of the labour force) is shown in Figure 2.24, where we use the *Labour Force Survey* measure rather than the less accurate *Live Register*, or entitlements based, measure. From a value of 7.3 per cent in 1980 (a value that was even then considered high!), the unemployment rate rose by almost 10.5 points (or 141,000 persons) by 1987, and had only declined to 14 percent by April 1991. It is now, in 1991, beginning to rise again.

Figure 2.25
Irish-British Unemployment Rate Gap



The rise in unemployment was not unique to Ireland: to a greater or lesser extent all other OECD states also experienced some degree of deterioration in their rates of unemployment. Given the traditional links between Ireland and Great Britain, the destination of most Irish emigrants, we show in Figure 2.25 the difference between the Irish and British rates.

After a long period of stability in this differential in the 1960s and early 1970s, the improvement in it between 1977-80 (a period of rapid public and private sector employment growth in Ireland) was followed by a serious deterioration (to the extent of almost 10 points difference) in the period 1982-89. This was one of the main factors serving to attract emigrants from Ireland to the British labour market. For a further treatment of the forces determining Irish unemployment, and an evaluation of explanations offered, see the separate article later in this *Review*.

2.3 WORLD INFLUENCES DURING THE 1980s

Having described the performance of the economy during the 1980s, and suggested qualitative reasons for its behaviour, we now examine in more detail some of the key explanatory factors underlying Ireland's recession and recovery. These factors can be usefully considered under two headings:

- (a) the impact of events in the world economy, and;
- (b) the role played by domestic policy actions.

In this section we examine world influences, and take up the policy issues in the next section. In both cases our methodology is as follows:

- (i) we first take some aspect of the world or policy environment and propose changes from the historical path. For example, we eliminate the OPEC-II recession by constructing a more benign hypothetical growth path for OECD output (an external variable in the ESRI model);
- (ii) we then recalculate the behaviour of the Irish economy on the basis of this changed hypothetical assumption;
- (iii) this new behaviour is compared with the historical behaviour, and the isolated effect of the changed assumption can be isolated.

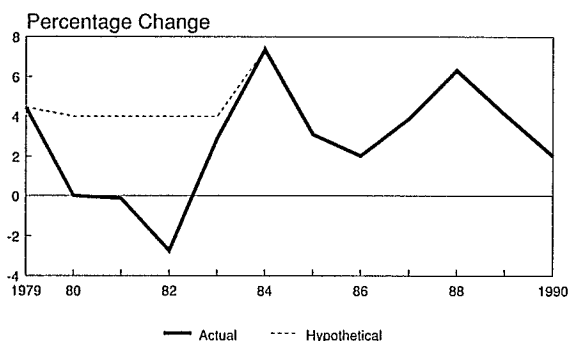
Such experiments are usually termed "counter-factual" simulations of the model. However, if Irish policymakers have little or no influence on the world economy, what is the point of carrying out counterfactual analysis where specific aspects of the world economic environment are changed? Two important justifications can be offered:

- (a) it is interesting to be able to quantify the role played by world factors in order to study their transmission to Ireland. The counter-factual simulation enables this to be done;
- (b) it permits one to isolate the role, if any, played by Irish policymakers. For example, if one finds that world influences can explain much of Irish behaviour, then one can more precisely establish the scope, albeit marginal, for corrective domestic policy actions.

In highly stylised terms, three particular deviations characterised the world economy of the 1980s:

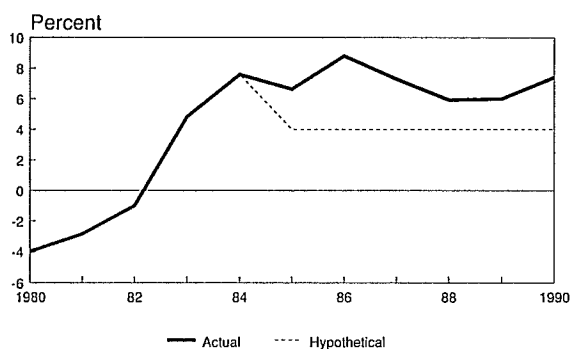
- (a) The low, even negative, growth in the main OECD economies in the early years, followed by a reasonably steady recovery, strong growth in the UK and USA cases (Figure 2.26).

Figure 2.26
World Growth Scenario
OECD Industrial Output



- (b) The switch from negative real interest rates in the early part of the decade to high positive real rates in the latter part (Figure 2.27)

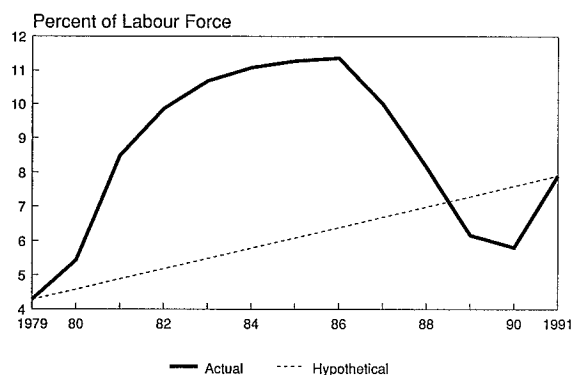
Figure 2.27
Real Interest Rate Scenario
5-Year Bond Rate



- (c) The dramatic rise in the UK unemployment rate in the first half of the decade, followed by a steady fall to one of the lowest rates in the OECD by the end of the decade (Figure 2.28)

It is of interest to quantify the extent to which these deviations from trend behaviour influenced the Irish economy, and this is done using the ESRI model. The counterfactual assumptions used are also illustrated in Figures 2.26-2.28, as dotted lines. So, for example, the "alternative" world is characterised by steady positive growth and modest UK unemployment during the first half of the decade and lower real interest rates in the second half.

Figure 2.28
UK Unemployment Rate Scenario



It should be noted that simulations like these alternative world scenarios are likely to push the ESRI model towards the limits of its reliability. As noted in the separate article on the model in this *Review*, making such radical changes to the external world economy would logically require changes in the very underlying structure of the model (the so called "Lucas" critique). In addition, making isolated specific changes to certain variables probably invalidates assumptions about other external variables. This means that our analysis provides a type of "ball-park" estimate of consequences of changes, and must be interpreted with caution. However, no other approach can hope to identify these effects.

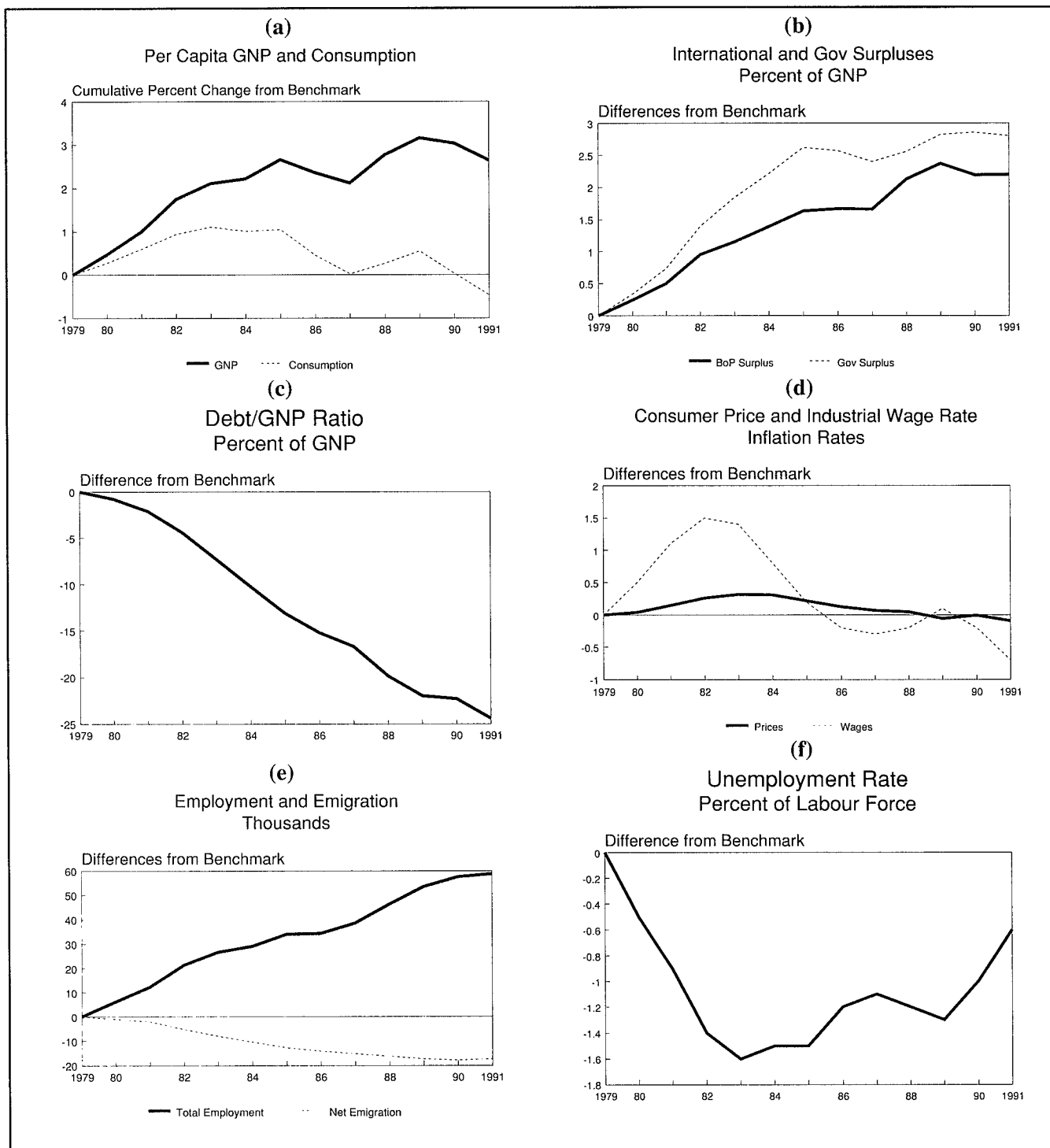
The Effects of Higher World Growth

We present our counter-factual simulation results in Figure 2.29 (a-f), in terms of deviations from the actual (or historical) outturn. We see that the elimination of the OPEC-II down-turn in world growth (illustrated in Figure 2.26 above) would have been likely to have had a dramatic effect on the Irish economy. Since the population would have changed (due to migration changes), we show in (a) the likely effects on GNP and consumption on a per capita basis. Both GNP and consumption could have been stimulated, the former by a cumulative 3 per cent by mid-decade.

The probable leakages out of the economy would have served to moderate the boost to personal disposable income, so there would probably have been little or no permanent improvement in per capita consumption. Both the government and international surpluses would have been greatly improved, by about 2.5 per cent of GNP (b), with the debt/GNP ratio lower by over 20 percentage points of GNP by 1990 (c).

Wage rates and prices would have been modestly higher in the first half of the decade, due mainly to the tighter labour market (i.e., higher employment, lower migration and lower unemployment), (d), (e) and (f).

Figure 2.29
OPEC-II Alternative World Growth Scenario
 (The term "Benchmark" refers to the historical outcome)



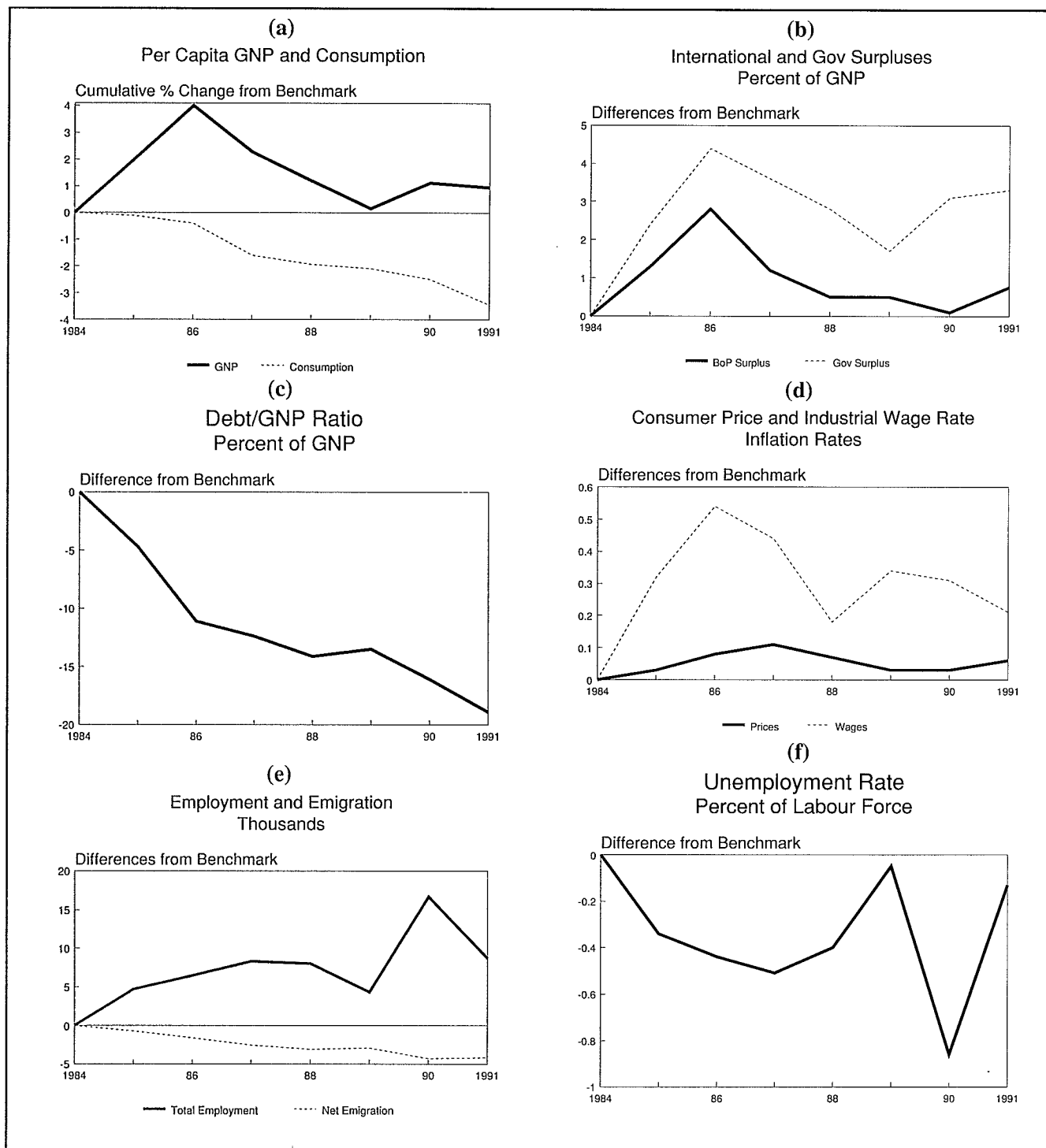
The Effects of Lower Real Interest Rates

We saw in Figure 2.27 that real interest rates did not reach high positive values until 1983. In this counter-factual simulation, for the period up to 1984, interest rates take their historical values, and are only kept below their historical values (at 4 per cent in real terms) from 1985 out.

As shown in Figure 2.30 (a-f), the effect on the

economy would have been stimulatory. The likely positive effect on growth, the improvement in the government and international balances, and the lowering of the debt/GNP ratio are particularly apparent. The negative effect on consumption would have been due largely to the reduction in domestic payments of interest on the national debt which form a sizeable component of personal disposable income.

Figure 2.30
Alternative Real Interest Rate Scenario
 (The term "Benchmark" refers to the historical outturn)



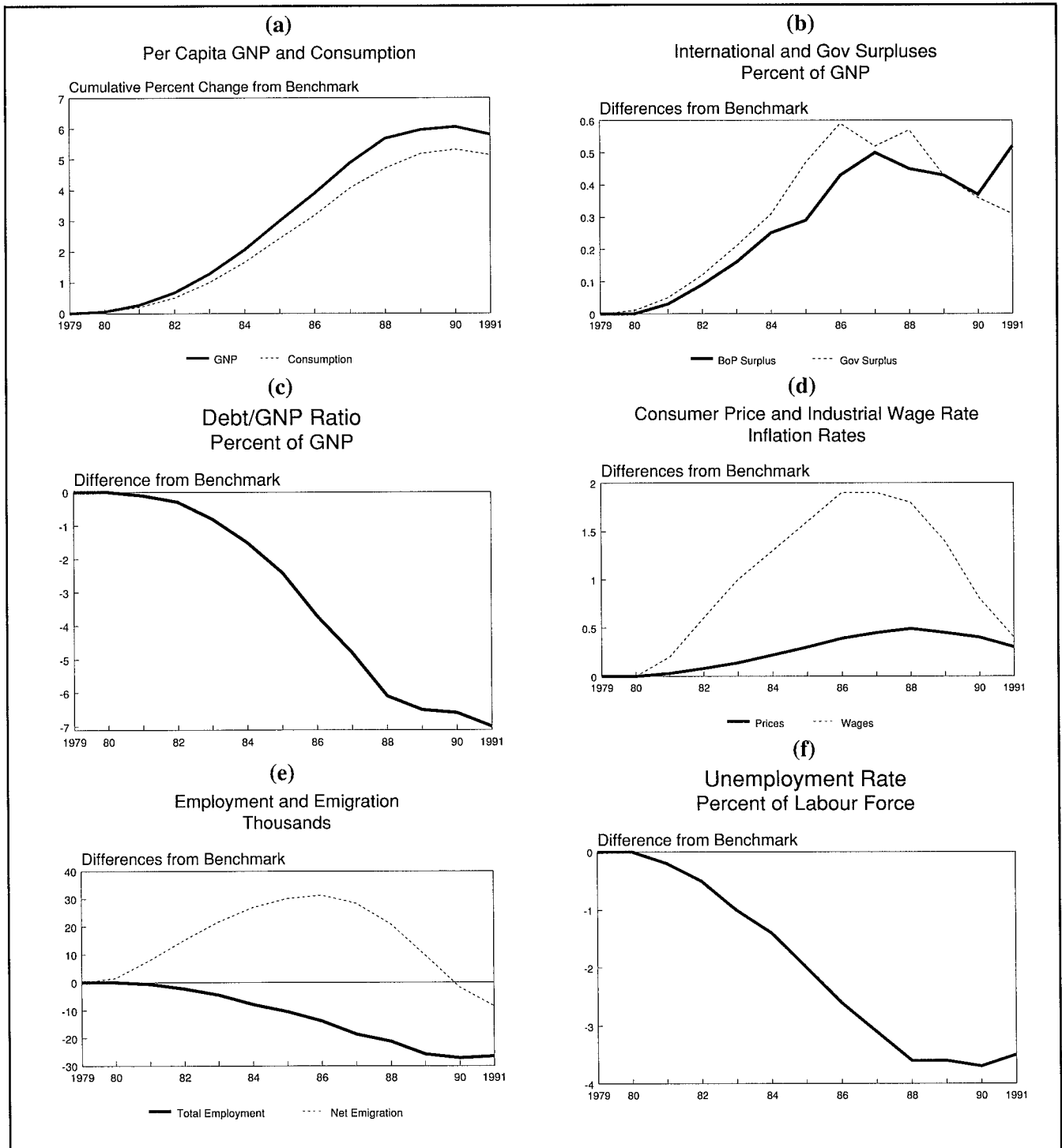
The Effects of Lower UK Unemployment

The hypothetical path of UK unemployment is shown in Figure 2.28 and the likely implications for the Irish economy are illustrated in Figure 2.31 (a-f).

The central influence of the UK rate of unemployment on the Irish economy operates through the migration mechanism. Lower UK unemployment

signals a more attractive UK labour market, and increased outflows of migrants from Ireland result. This lowers the Irish rate of unemployment, drives up wage rates, and lowers employment. While the effects on GNP are likely to be negative, the probable drop in population would result in a significant increase in *per capita* GNP.

Figure 2.31
Alternative UK Unemployment Scenario
 (The term "Benchmark" refers to the historical outturn)



In summary then, the above counter-factual simulations illustrate that the severe OPEC-II related down-turn in the world economy placed the Irish economy under serious strain, at a time when counter-cyclical fiscal policy, as we shall show, was exerting further downward pressure. For example, the combination of a better pattern of world growth in the 1980-84 period, lower real interest rates and the absence of high UK unemployment would have been likely to have reduced the Irish unemployment rate by over four percentage points in 1986. The exchequer surplus could have been 7 percentage points of GNP higher (equivalently, the EBR lower), with a debt/GNP ratio 30 percentage points of GNP lower than actual.

2.4 POLICY AND PERFORMANCE

In the pre-OPEC world, the orthodox, mainly demand-side, Keynesian orientation to policy assumed that the public sector could be used to stimulate the private sector through the multiplier effects of public expenditure policies on private activity. The fiscal expansions of the 1970s drew their inspiration from this approach to economic theory, albeit with a seriously flawed under-evaluation of the leakages from the economy through imports and financial outflows.

Advances in applied economic theory and more detailed study of the Irish economy have changed that earlier point of view. More attention is now given to ways in which state activity (e.g., public sector employment increases, tax rises, etc) may crowd out activities in the private sector, thus generating offsetting forces to the Keynesian demand expansion ones. We have seen above that the determination of wages is one such crucial mechanism that can be influenced by public sector activity, mainly through the tax "wedge" and unemployment effects. These crowding-out, or offsetting, forces were particularly important in the period 1980-1987.

Ireland entered the 1980s after a decade of expansionary public policy, a stance that was strongly pro-cyclical in the latter part of the 1970s (i.e., it boosted growth at a time when the world business cycle was already generating strong growth). This placed policy makers in a very invidious position when the OPEC-II recession struck in that a contractionary fiscal policy *had* to be followed if the escalating growth in the debt/GNP ratio was to be contained. We have seen above that the downturn in the world business cycle was simultaneously inducing a business downturn in Ireland.

During the period 1980-87, the level of public expenditure rose moderately in real terms and resort was made to sharp increases in taxation. After 1987 an political consensus emerged which permitted sharp cuts in real public expenditure against a broadly neutral taxation policy. In order to examine the separate and joint role of tax and expenditure policy on the economy during the 1980s, two counter-factual fiscal experiments are suggested:

(a) in the first we simply index tax *rates*, i.e., freeze income tax rates and VAT rates and index excise tax rates, while leaving expenditures and all other external variables at their historical levels for the period of the 1980s and;

(b) in the second we reverse the process, i.e., freeze *expenditures* in real (1979) terms and keep tax rates and all other external variables at their historical levels.

The summary results are shown in Figures 2.32 and 2.33, while Figure 2.34 shows the case of simultaneous tax and expenditure indexation.

Tax Indexation Scenario

The tax indexation simulation scenario is one where tax revenues are considerably lower than the actual revenues, since the hypothetical indexed tax rates are very much lower than actual rates. The most striking implications of this scenario for the economy are shown in Figure 2.32 (a-f).

Per capita consumption would have been greatly increased relative to the actual outturn; there would have been a massive deterioration in the exchequer and international balances, with consequential escalation in the debt/GNP ratio. The labour market effects could have been dramatic: employment up by almost 100,000 jobs, much lower emigration, a more modest fall in unemployment, and lower wage rates.

However, this scenario was never a realistic option for Irish taxation policy since the simulation indicates that it would have been almost certainly ruled out by the huge deterioration in the public and international balances, and the consequential massive foreign borrowing needed to sustain them. Long before reaching the levels shown in the scenario, Ireland's credit worthiness is likely to have collapsed and responsibility for policy decisions placed in the hands of international lending agencies.

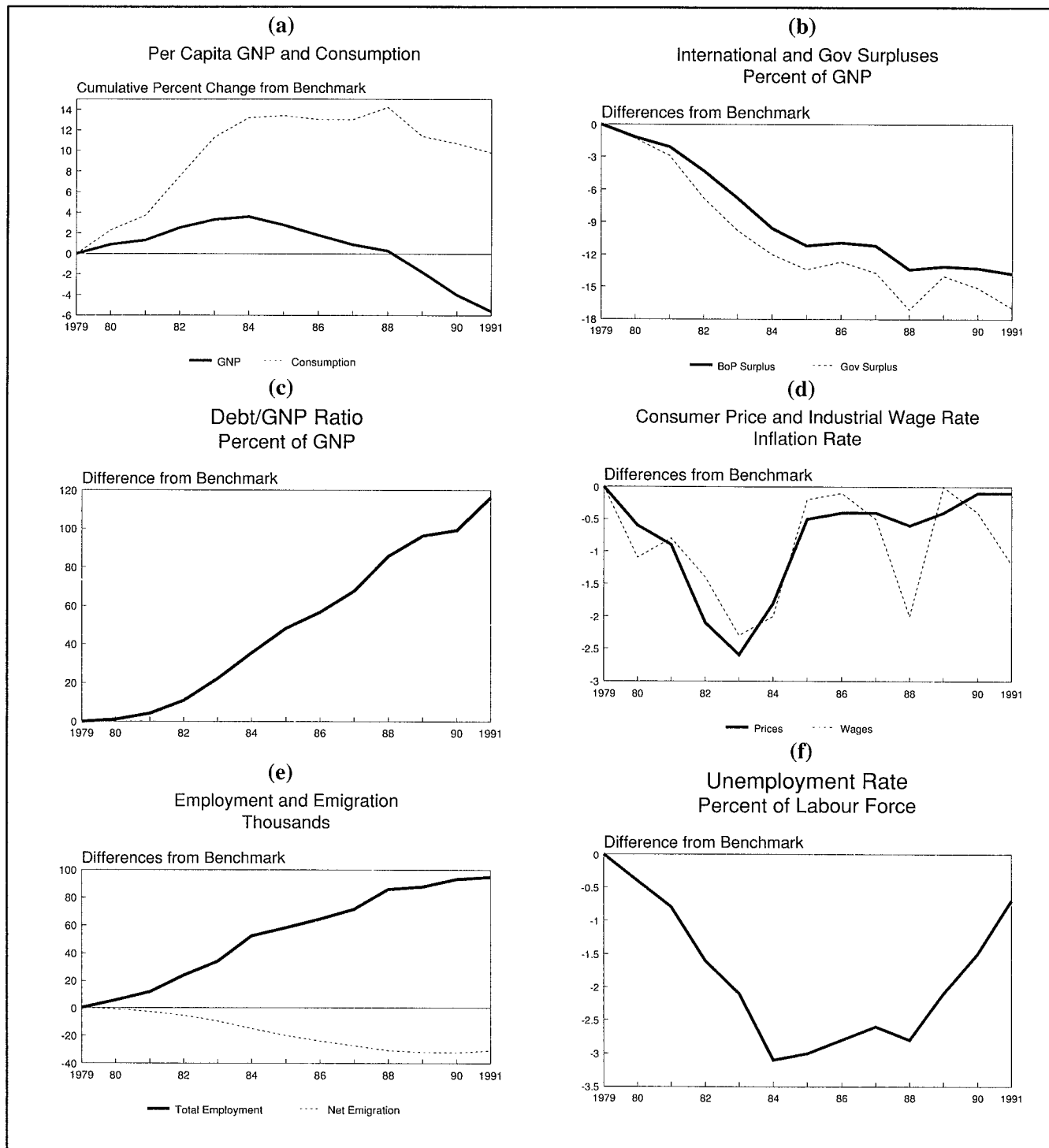
Expenditure Indexation Scenario

The expenditure indexation scenario is one where most programmes are maintained in constant base year terms (i.e., at 1979 levels). So, for example, public sector employment is kept fixed throughout the 1980s at its 1979 value; social welfare transfer rates are indexed; Public Capital Programme investment expenditures are also indexed. Nevertheless, national debt interest payments are still determined within the model as a function of the level of debt and interest rates. An assumption is also made that interest rates are unchanged from their historical values.

The effects of this scenario (Figure 2.33) are likely to have been more limited by comparison with the previous tax indexation simulation. For the first half of the 1980s, fiscal indexation would have represented a moderately "tighter" fiscal stance than the actual one. Hence, the public and international balances are likely to have improved, the debt/GNP ratio declined, with lower growth, and the labour market disimproved (i.e., lower employment, higher emigration, increased unemployment rate).

What this simulation illustrates is that a hypothetical policy of public expenditure indexation from 1979 to 1991, when combined with the actual policy regime of high taxation, would have been technically quite feasible and would have been likely to have brought about a dramatic improvement in the fiscal and international balances and the debt/GNP ratio. The likely costs in terms of lower per capita growth, lower employment, and a combination of higher emigration and unem-

Figure 2.32
Tax Indexation Scenario
 (The term "Benchmark" refers to the historical outturn)

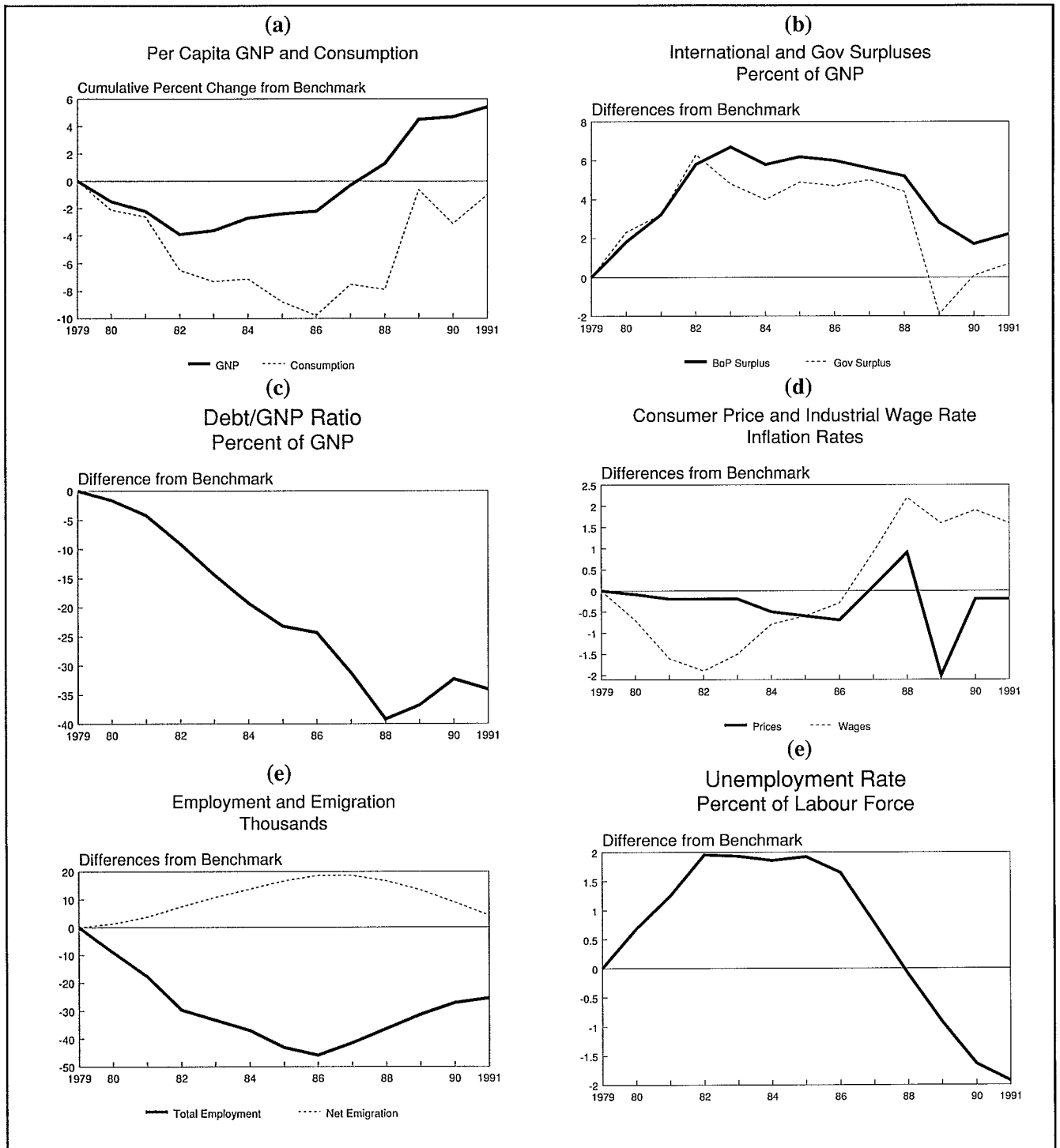


ployment are also illustrated. The decision as to whether these costs would have been outweighed by the benefits is more a matter of political than economic consideration.

The simulation has many limitations, however, not least of which is the assumption of interest rates unchanged from their historical levels. In practice, a clearly signalled policy regime of high taxes and frozen

public expenditures from 1980 to the end of the decade would undoubtedly have led to a fall in the margin of Irish interest rates over world rates, and could have provided a strong stimulation to the economy as the OECD came out of recession after 1983. Was this a great missed opportunity, or were the policies actually followed inevitable? We shall never know.

Figure 2.33
Public Expenditure Indexation Scenario
(The term "Benchmark" refers to the historical outcome)

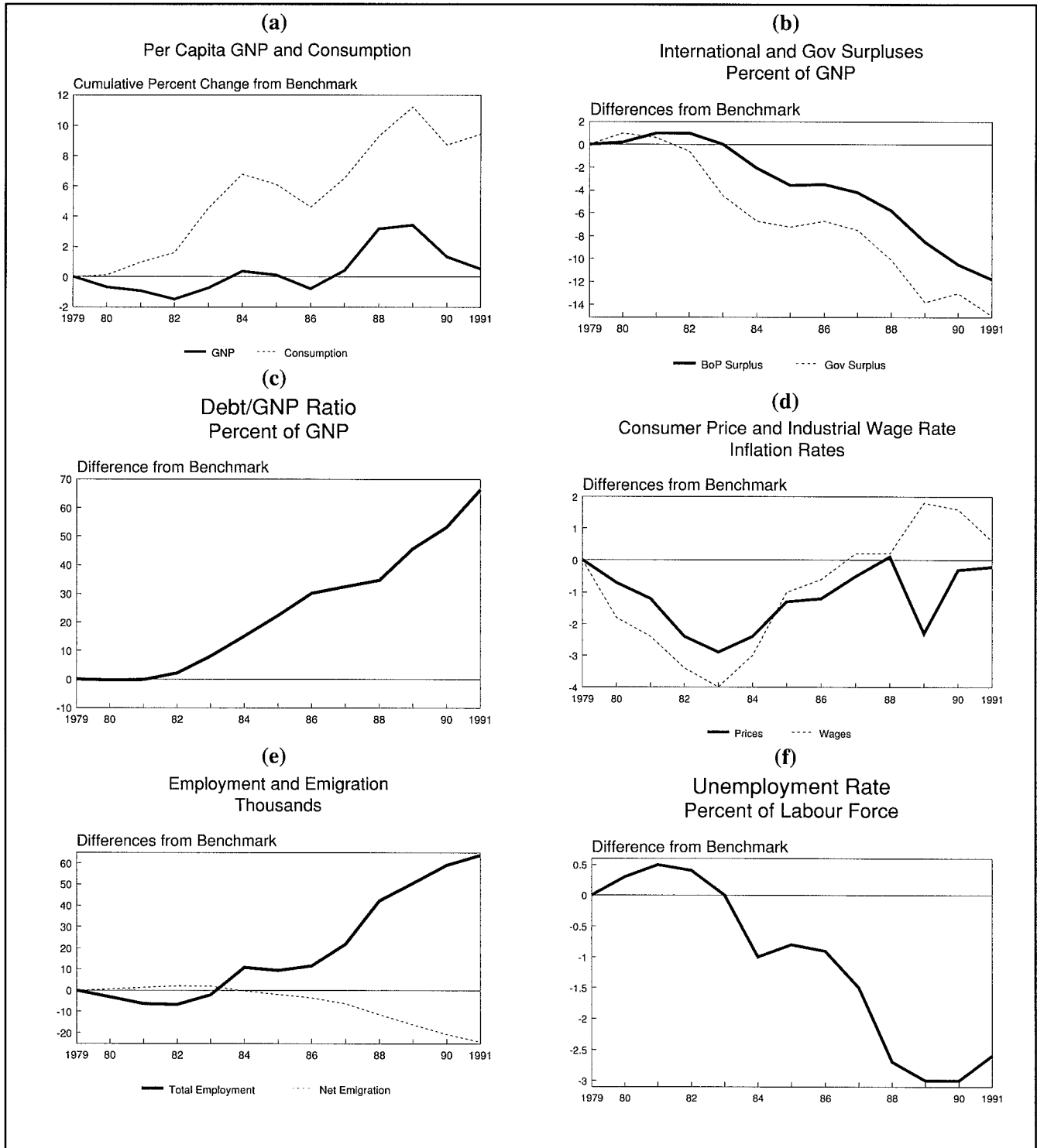


Complete Fiscal Indexation Scenario

The combination of tax and expenditure indexation is shown in Figure 2.34. As in the tax simulation, the improvements in growth and in the labour market would

never have been a feasible prospect due to the massive deterioration in the public and international balances and the accumulation of extra debt (over and above the historical debt accumulation).

Figure 2.34
Complete Fiscal Indexation Scenario
 (The term "Benchmark" refers to the historical outcome)



In summary, what these three fiscal indexation simulations illustrate is that neither tax indexation nor the combination of both tax and expenditure indexation were feasible options in the 1980s if the public and international accounts were not to deteriorate beyond the historical outturn, thus calling into question Ireland's credit worthiness. We do not examine here the reasons why the Irish economy entered the 1980s in such a precarious state of disequilibrium since this is the subject matter of a separate study ("On the Causes of Ireland's Unemployment", by Frank Barry and John Bradley, to appear, *Economic and Social Review*, 1991).

We can interpret these simulations from a slightly different perspective. What they illustrate is the high price that was probably paid during the 1980s, in terms of lower growth and labour market deterioration, as a result of the *necessity* to raise taxation and cut expenditure during the 1980s. This arose from the requirement to sustain a much expanded state sector out to 1987, and to cut it back in size over the period 1987-1990.

Finally, if we put the above world and fiscal simulations together, they illustrate the folly of the excessive fiscal stimulations of the 1970s and the particular danger Ireland faced when the world economy deteriorated in the early 1980s, just as the bills for past fiscal extravagances fell due.

2.5 IRELAND'S RECOVERY: 1987-1990

The sharp recovery of Irish growth in the post 1987 period illustrated earlier was dramatic, took most commentators by surprise (see, however, the previous two issues of this *Review!*), and has been the subject of much international commentary. We have outlined above the main characteristics of this recovery: a substantial improvement in growth, rapid improvement in the public and international balances, the completion of the convergence of price and wage inflation to German levels, and a more modest improvement in employment and unemployment.

The reasons for this recovery have already been examined in the domestic and international literature (D. McAleese, "Ireland's Economic Recovery", *Irish Banking Review*, Summer, 1990; F. Giavazzi and M. Pagano, *Can Severe Contractions be Expansionary*, Discussion Paper, Centre for Economic Policy Research, London, 1990). Both approaches are based on the notion of an "expansionary fiscal contraction" (EFC), where the implementation of a credible adjustment programme of expenditure cuts is the central feature in a restoration of private sector confidence, both processes taking place against a benign external economic climate. Interpreted literally, public expenditure cuts actually boost aggregate growth in an EFC, all other things being equal.

Although the notion of an expansionary fiscal contraction is novel and full of interesting insights, it is ultimately unsatisfactory for many reasons. First, the element of restored private sector "confidence" is introduced as a *deus ex machina* to replace the asserted inadequate predictions of a conventional Keynesian analysis of Ireland's fiscal adjustment. No quantification of the magnitude of the "confidence" effect is made, although an implicit appeal is made to the notion of

"Ricardian Equivalence" (i.e., the idea that a credible programme of public expenditure cuts is rationally interpreted by the private sector as a harbinger of future tax cuts, thus boosting present consumption and investment). The most recent empirical research casts considerable doubt on this notion (see K. Whelan, "Ricardian Equivalence and the Irish Consumption Function: The Evidence Re-Examined", in *The Economic and Social Review*, Vol. 22, No. 3, 1991).

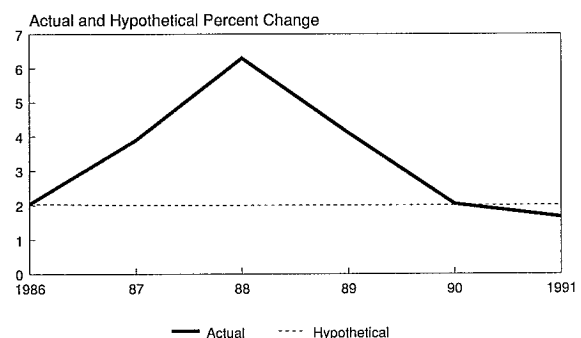
Secondly, no attempt at formal quantification is made of the relative roles of world and domestic factors in Ireland's recovery, other than noting that the external economic climate was favourable during the 1986-90 period. Basically, the largely descriptive approach, while suggestive, does not allow one to isolate one effect from another. If an EFC needs an accompanying improvement in the world economy in order to work, then the concept amounts to nothing more than the platitude that the net effect of fiscal contractions and world expansion can be beneficial to a country like Ireland.

Thirdly, the impression is conveyed that the conventional or orthodox Keynesian or neo-Keynesian explanation of Ireland's recovery is inadequate and misleading (see McAleese, *op. cit.*, page 20). Without any doubt, conventional state-of-the-art neo-Keynesian models handle expectations inadequately, but it is probably a gross overstatement to assert that *only* expectations matter and that such models have nothing to teach us.

For all its limitations, it is of interest to use the model to explore the crucial period of Ireland's recovery, 1986-90, and attempt to distinguish between external and domestic influences. To do so, we need to make some stylised assumptions with a view to isolating the key factors driving the economy during the recovery period. We tentatively identify these as the pick-up in world growth after 1986, the rapid reduction in the rate of unemployment in the UK, and the sharp reduction in the Irish saving ratio, and the stance of fiscal policy. The stylised assumptions we make initially are as follows:

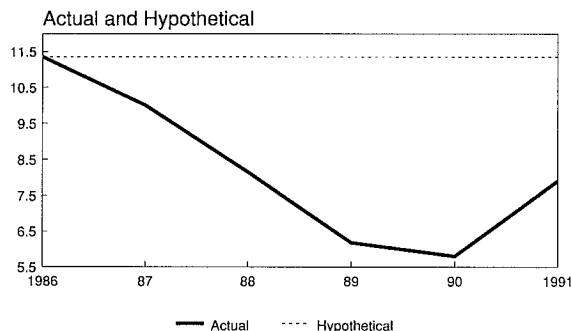
- (a) a hypothetical world growth which continued at its (low) 1986 level of about 2 per cent, thus eliminating the second resurgence of growth that took place in the latter half of the decade (Figure 2.35);

Figure 2.35
OECD Industrial Growth
Irish Recovery Simulation



(b) a UK unemployment rate that stayed high, at its 1986 value of 11.4 percent of the labour force, and failed to decline as it did during the "Lawson" boom (Figure 2.36);

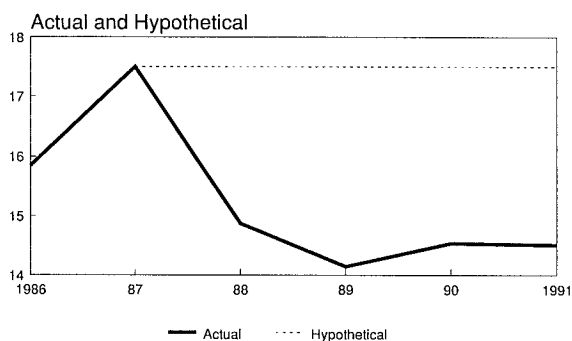
Figure 2.36
UK Unemployment Rate
Irish Recovery Simulation



(c) an Irish savings ratio that remained at its high 1987 value of 17.6 per cent of personal disposable income and failed to fall as it did over the recovery period (Figure 2.37).

If the consumption function in the ESRI model were performing adequately, this latter assumption would not be required. The advocates of the notion of an "expansionary fiscal contraction" seem to be claiming that the fall in the Irish savings ratio (equivalently, the boost to growth in consumption) is explained entirely by the effect the fiscal cuts of 1987-89 had on consumer confidence. An alternative explanation is that following the world recovery from the October 1987 stock market crash, a higher level of Irish consumption was driven by confidence in the health of the *world* economy and wealth effects, similar to those used successfully to explain the phenomenal drop in the UK savings ratio after the "Lawson boom". If ever there was an area requiring urgent further research, this is it.

Figure 2.37
Irish Savings Ratio
Irish Recovery Simulation



Using the above stylised assumptions, and keeping all other assumptions in line with their historical values, we use the model to simulate over the "recovery" period. The effects on a range of variables are shown in Figure 2.38 (a-f).

The overall deterioration of the simulated outturn relative to the historical outturn is apparent: lower GNP and consumption growth, even lower on a *per capita* basis; a deterioration of almost 3 percentage points of GNP in the exchequer surplus; a modest 1 point rise in the balance of payments surplus; a rise of almost 17 points in the debt/GNP ratio; lower wage and price inflation; a loss of 25,000 jobs; reduced emigration and a 3 point rise in unemployment.

We now repeat the simulation, adding a fourth change:

(d) Public expenditure and taxation policies are indexed from their 1986 levels, thus eliminating the actual real cuts in expenditure that took place

The results are shown in Figure 2.39 (a-f) and can be compared to the previous simulation. Of chief interest is the more severe deterioration in the public and external balances, and the 27 point increase in the debt/GNP ratio. Thus the historical improvement in the public finances can be almost completely accounted for by the world and fiscal shocks. With the exception of migration, the labour market effects are modest.

What these simulations show is that a conventional neo-Keynesian model can adequately account for many of the stylised facts of Ireland's economic recovery during the 1986-90 period.

For example, interpreting the results of Figure 2.38 from a different perspective, they illustrate that the strong resumption of world growth, the fall in UK unemployment, and the drop in the Irish savings ratio are likely to have provided a significant boost to the economy over and above how it would have performed in the complete absence of these positive "shocks":

- (a) *per capita* GNP and consumption was probably raised by a cumulative 6 per cent;
- (b) there may have been a modest improvement of the balance of payments of 1 per cent of GNP;
- (c) the debt/GNP ratio was probably reduced by almost 20 per cent of GNP;
- (d) employment is likely to have been boosted by some 25,000, with a fall of some 3 points in the unemployment rate.

There could also have been some adverse effects:

- (e) a likely deterioration in the EBR by 2.5 percentage points of GNP, due to the boost to private consumption and;
- (f) probably somewhat higher wage and price inflation.

But of course, these shocks to the world economy took place at a time when fiscal policy was strongly contractionary. So, superimposing fiscal indexation on the above scenario resulted in a somewhat reduced boost to growth; a marked improvement in *both* the EBR and balance of payments; a much greater reduction in the debt/GNP ratio; more attenuated inflation effects; very little net change in employment; sharply reduced emigration; and a more modest reduction of under 2 percentage points in the rate of unemployment. Indeed, the results of the aggregate "world" and "indexation" simulation has a remarkable resemblance to those characteristics of Ireland's recovery claimed by the advocates of "expansionary fiscal contractions".

Figure 2.38
Irish Recovery Scenario: World and Savings Ratio Factors
 (The term "Benchmark" refers to the historical outturn)

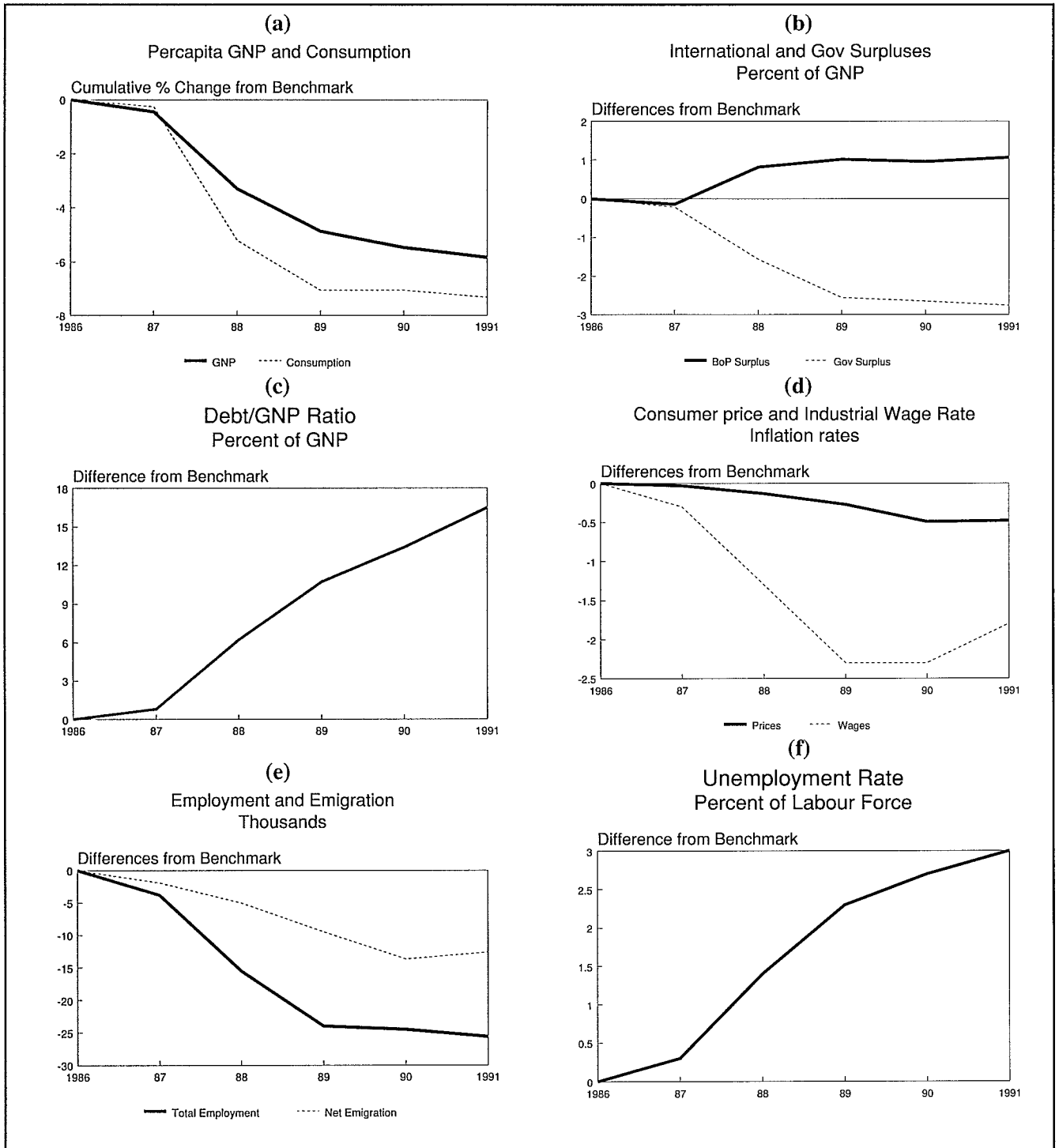
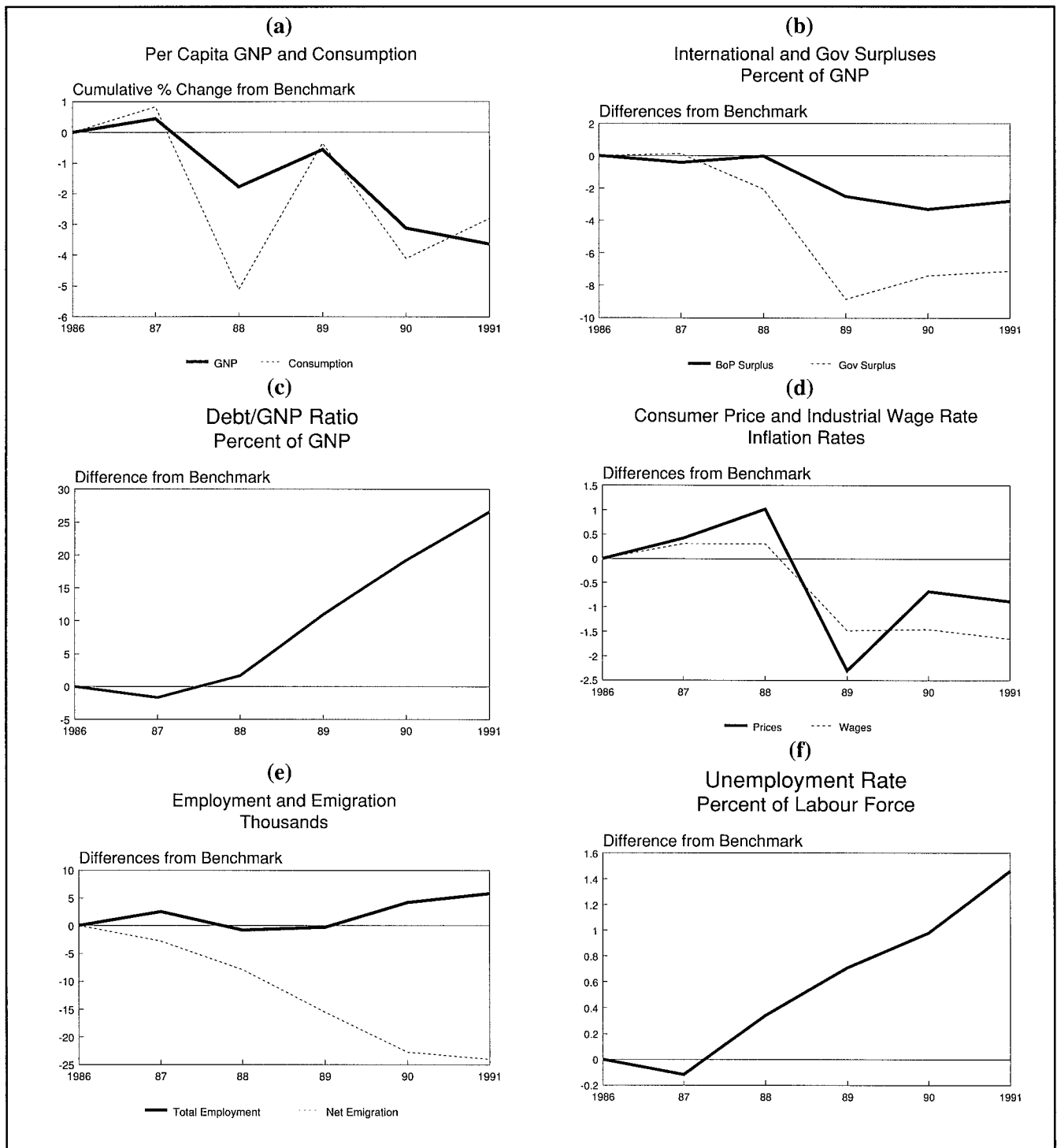


Figure 2.39
Irish Recovery Scenario: World, Savings Ratio and Indexation Factors
 (The term "Benchmark" refers to the historical outturn)



2.6 LESSONS FROM THE 1980s

From the experiences of the 1980s, we can draw some salutary lessons:

- (a) The Irish economy is extremely vulnerable to influences from the world trading environment and on balance we tend to inherit slightly better than the world growth rate, other things being equal;
- (b) competitiveness is important, and close attention

must be paid to any factors which might cause a deterioration in international competitiveness, either directly, or indirectly through cost push from the sheltered sector;

- (c) fiscal expansions can be a negative sum game in the medium term and in very particular circumstances. Any short-term gains tend to be eroded quickly as the labour market tightens and tax rates are forced up to choke off the accumulation of debt. The crowding out mechanisms then operate through a

- loss of competitiveness, through the tax wedges and the Phillips curve;
- (d) wage determination mechanisms are crucial to the growth of the economy. Nevertheless, the benefits of previous pay pacts seems to operate through their association with industrial peace rather than through fundamental changes to bargaining mechanisms. As experience with long-term pay pacts builds up, there may indeed prove to be a fundamental regime shift;
 - (e) the benefits to the economy from the foreign-owned high-technology sector are manifest. However, any long-run gain in competitiveness also has a significant effect on the traditional and food manufacturing sectors. Here the net gain to the economy (i.e., contributions to GNP and employment) could be potentially much greater than for the high-technology sector because the indirect links to the market services and agriculture sectors are also greater;
 - (f) The recovery of the period 1987-1990 was driven largely by the growth in the world economy and by stronger private consumption and investment. These effects more than offset the negative effects of the public expenditure cut-backs which were needed to restore balance to the public finances. These cut-backs may also have induced a confidence effect, although its separate importance is impossible to quantify.

BACKGROUND ASSUMPTIONS

3.1 INTRODUCTION

Since we last published our *Medium-Term Review* two years ago there has been a major change in the face of Europe with the political and economic revolution in Eastern Europe. The speed and nature of the changes have taken everybody by surprise. It has changed the economic agenda for the EC and has greatly altered the economic environment in which the Irish economy will have to operate. While 1992 and the changes which it is bringing remain very important, new developments within the EC including Economic and Monetary Union (EMU), the crisis in the Common Agricultural Policy (CAP) and the pressures arising from the GATT have all affected the prospects for the Irish economy.

On the domestic front the changes have been of a much more limited nature. The public finances have shown some further improvement and the policy of tracking the DM within the EMS has become firmly established.

The purpose of this Chapter is to discuss the external environment in which the Irish economy will operate over the next five years and to outline a stylised domestic policy environment within which we develop our central forecast.

3.2 WORLD ECONOMIC OUTLOOK

Since the end of the Second World War the international economy has become steadily more interdependent. Even the United States has recognised that it can not determine its economic policy unilaterally. For small countries, such as Ireland, the degree of economic independence is now seen to be strictly limited. Thus the single biggest factor determining Ireland's economic prospects in the medium term will be the development of the world economy.

The single biggest shock to the developed economies has come from German unification. The pace at which it has had to proceed has left all forecasting bodies trailing behind events. Thus, while there are a range of different world economic forecasts available from major institutions, they tend to be rather out of date by the time of their publication. As a result, in this *Review* we have had to modify some of these forecasts to produce a coherent and up to date world scenario on which to base our forecasts for the Irish economy. We have relied heavily on the forecasts published in the *National Institute Economic Review* (NIESR); the *OECD Economic Outlook*; a working paper on the European economy prepared by the Netherlands *Central Planbureau*; the *IMF World Economic Outlook*; and the London Business School *Economic Outlook*.

In this Section we consider first the prospects for Germany and how developments in that economy will affect the rest of the EC. We then turn to the prospects for the two other economies which have particular importance for Ireland: the UK and the USA. Finally, we consider developments in the EC which will have major significance for Ireland over the rest of the decade: reform of the CAP, Economic and Monetary Union, and 1992.

3.2.1 German Unification

The process of the unification of the German economy has effected a major change in the outlook for the EC economy in the immediate future. The problems and questions posed by this process should also be seen as a foretaste of the problems likely to arise in the possible extension of the EC to include countries in Eastern Europe towards the end of the decade. This latter process is likely to have a long-term effect on the environment in which the Irish economy operates.

The initial reaction outside Germany to the process of German unification has been a fear that political priorities have taken precedence over economic wisdom. However, this view of the unification process ignores the economic dilemma which faced the Bonn government at the beginning of 1990. With the elimination of the border between East and West Germany in 1989, the barriers to movement of the labour force were removed. This created the potential for a massive and very disruptive movement of population; workers in the East, while free to move to the West, had a very much lower standard of living than their compatriots in what had been the Federal Republic. This huge gap had to be closed sufficiently to reduce the potential attraction of migration.

The Bonn government faced a choice on the rate of exchange at which to convert wage rates and savings in the old GDR into DMs. A low rate of exchange (e.g., 4:1) would have left industry in the East more competitive but it would also have left living standards far below those in the old Federal Republic. This could have precipitated the migration which Bonn sought to avoid.

On the other hand, too high a rate of exchange, while ostensibly narrowing the gap in living standards, would leave all of industry in the East profoundly uncompetitive precipitating massive unemployment. It was this latter high risk strategy which was eventually adopted.

Rates of pay in the East are now significantly closer to those in the West than would have been the case using a more *market* oriented approach. The advantage of this solution is that it greatly reduced the flow of migrants in 1990 while they still had employment in the East. Already in 1989 immigration into the Federal Republic from East Germany and the rest of Eastern Europe amounted to approximately 750,000, 1.2% of the population of the Federal Republic. However, the major long-term problem posed by the solution adopted is that, by raising real wage rates in the East, it made much of the inefficient industrial plant in the East totally uneconomic. With the provision of Federal rates of unemployment payments and the attractions of high rates of pay in the West, a massive rigidity has been built into the labour market in the East. Wage rates can not adjust sufficiently to make employment in the East profitable in the immediate future.

The result of this policy is that the unemployment rate in the united Germany will probably rise well above 11% of the labour force this summer. According to a recent report by Germany's five leading economic institutes, over 15% of the population of the united Germany could be unemployed or on short-time working by the end of the year. This is a level similar to that in Ireland. Whether eligibility for unemployment benefits will prevent a migration by the unemployed from the East remains to be seen. However, it is clear that Germany now has a major unemployment problem to add to the other problems arising from the undeveloped infrastructure in the East.

In the past thirty years, with a very successful economy and a relatively low level of unemployment, there were few internal pressures in the Federal Republic of Germany to change what proved to be a successful economic formula. However, the changed economic circumstances arising from unification give cause for more uncertainty about future economic policy. Over the past year precedence has been given to the problems of unification rather than to the more traditional stance of adjusting policy to minimise inflation. While monetary policy has tightened considerably, fiscal policy has been lax, allowing the emergence of a government deficit of over 5% of GNP. The corollary of this stance has been a rapid growth in GNP in the West, combined with some rise in inflation and a considerable rise in interest rates.

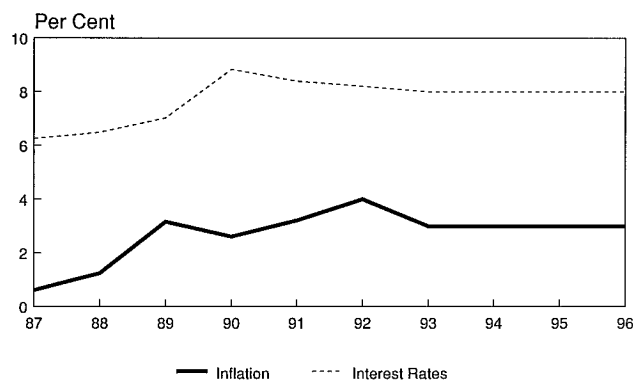
We have assumed that the budget deficit in Germany is reduced gradually over the next five years. However, domestic demand will continue to grow quite rapidly resulting in the balance of payments for the united Germany moving into deficit. This means that Germany will continue to provide an attractive market for Irish firms. The way unification has taken place, with a rapid extension of coverage by West German firms in the distribution sector into the East, means that for those Irish firms already supplying retailers or wholesalers in Germany, the growth in the market will provide new opportunities. The upward revision in the growth projections for Germany must be good news for Irish firms.

Where the uncertainty arises is over how the German administration will handle the potential inflationary effects of the rapid growth in domestic demand combined with falling output in the former GDR. The initial tax increases announced for this year, when combined with the fact that firms in the West have reached capacity is giving rise to an increase in the rate of inflation. Current wage settlements are running at between 6% and 7%. To slow the growth rate and reduce inflationary pressures the Bundesbank has already raised interest rates.

The need to finance the government deficit and the necessary investment in the East will maintain upward pressure on interest rates for the foreseeable future. Any relaxation by the Bundesbank could accentuate the present inflationary pressures.

In this *Review* we have assumed that an increase in tax rates will result in the German inflation rate (consumer prices) peaking next year at 4% with a gradual fall thereafter to 3% by 1995 (Figure 3.1). A return to a more normal pattern of 2.5% inflation might be expected in the second half of the decade.

Figure 3.1
Germany
Inflation & Interest Rates



To maintain downward pressure on inflation nominal interest rates in Germany will show only a small fall from their present level (Figure 3.1). Even in the second half of the decade real interest rates in Germany should remain above their average level for the 1960-90 period. This has serious implications for other members of the EMS, including Ireland. High real interest rates are likely to be transmitted to all other EC members helping to switch resources to finance the restructuring of East Germany. It will tend to offset the demand effects of the higher growth in Germany. For debtor countries, such as Ireland, the deleterious effects of the high interest rates will probably be more than enough to offset the benefits from a higher German growth rate.

In spite of the high interest rates in Germany, it seems likely that the DM will be weaker on world markets than in the 1980s. The prospect of 15% unemployment in Germany, together with the switch to deficits on the balance of payments and government accounts, could lead to a depreciation of the DM compared to the US\$ of nearly 2% a year until 1996.

There remains the possibility that the German government may fail to deal with the current problems of their economy, allowing the DM to weaken within the EMS. While this seems unlikely today, if it were to happen, it could result in French franc interest rates falling below German rates. Irish rates might follow their lead resulting in a reversal of the forecast differential between Irish and German rates. While such an outturn might sound attractive, it could be accompanied by many other changes in the EC environment making it a very unfavourable environment for Ireland.

When the iron curtain vanished at the end of 1989 it seemed possible that there could be a major flow of resources, not just to East Germany, but also to the other countries of Eastern Europe undergoing change. However, it is now clear that the process of reform in those countries is very complex and it will be a number of years before they begin to attract a major flow of funds for investment. At present they are not competing with Ireland for investment.

However, in the longer term investment inflows into these countries from the developed economies will both be necessary and attractive. Coming on top of the needs of the former GDR, this will put upward pressure on funds. Thus real interest rates throughout the world can be expected to remain fairly high over the rest of the decade.

So far we have assumed a reasonably benign scenario for the economic development of Eastern Europe. However, there remains the danger that the process of adjustment may not be smooth. It is clear that the Soviet Union is suffering from massive economic problems. These problems, and those of the other countries in Eastern Europe, are likely to be aggravated by the political pressures inherent in resurgent nationalism. While the EC may try and insulate itself from these problems, the possibility of massive migration, following on famine or other disasters, could force the EC to devote substantial resources to economic stabilisation in Eastern Europe.

3.2.2 The United Kingdom

While structural changes in the Irish economy have made it much less dependent on the UK than in the past, developments in the UK can still have a big impact, both on the demand for industrial exports and on the Irish labour market. The UK represents the largest market for our goods so that the rate of growth of that market and the competitiveness of Irish producers in it is still of major importance, especially for the traditional sector of Irish manufacturing. The high-technology and food-processing sectors are less affected by developments in the UK.

In addition to its role as a market for our goods, the UK economy is of importance as a market for Irish labour. The UK has traditionally been the most important destination for Irish emigrants. As a result, emigration from Ireland is very sensitive to the difference between the unemployment rate in Ireland and the UK (Honohan, P., 1984: "The Evolution of the Rate of Unemployment in Ireland 1962-1983", in *Quarterly Economic Commentary*, The Economic and Social Research Institute, May). If UK unemployment rises, as

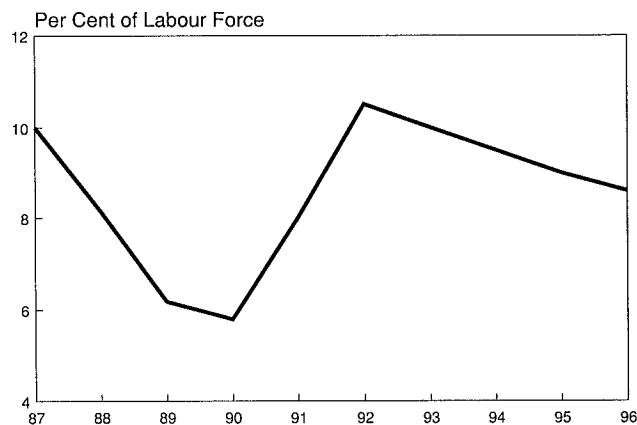
is the case this year, emigration tends to fall as job opportunities in Britain become scarcer. This raises unemployment in Ireland.

Current forecasts suggest that the UK economy will recover slowly from its recession. It has lost competitiveness in recent years and its rate of inflation of wages and prices is still running well above the European norm. While there has been an improvement in its balance of payments, it still remains in deficit in spite of the low level of activity. Because the UK economy is locked into the EMS at a rate of exchange which leaves it relatively uncompetitive, the medium-term growth prospects will remain weak. Certainly, the recovery will be much weaker than that of the second half of the 1980s. While Irish firms will remain competitive in that market, they will face only a slow growth in demand.

The rise in UK unemployment over the last year has been very rapid. It is likely to continue rising until after the recovery in the economy has begun. Thus we see the UK unemployment rate increasing to over 10% of the labour force by 1992, back to the level experienced in 1987, though still lower than that of the early 1980s (Figure 3.2). This rise in unemployment is necessary to reduce inflationary expectations within the UK. If the UK adjusts rapidly to the changed exchange rate regime then it will cease rising. However, on current trends, the NIESR *Review* does not expect UK unemployment to begin falling until 1993 and, even then, to remain above the end 1990 level for the rest of the decade.

Figure 3.2

UK Unemployment Rate



The current policy on inflation in the UK seems to be a rather weaker copy of the policy of the early 1980s. A tough exchange rate regime is imposed with high interest rates. This halts growth and raises unemployment. This, in turn, cuts the rate of inflation. When the rate of inflation is down to the EC norm the UK may then attempt to correct its competitiveness problem by a final once off devaluation within the EMS. This would be a rather similar policy to that adopted successfully by Ireland in 1986. In this *Review* we have assumed that the UK devalues by around 3% in 1994. This change would be quite small and could be accommodated within the current EMS bounds for Sterling. The expectation of such a change will leave nominal interest rates in the UK above German and Irish levels up to at least 1994.

3.2.3 The United States of America

When we prepared our last *Review* in 1989 the major cause of economic uncertainty was the state of the US economy. Over the last two years the outlook for the US budget deficit has, in fact, worsened. To some extent the disimprovement is merely a recognition of an underlying problem with the US financial system and to some extent it reflects a more realistic set of projections by the US administration.

However, while the US budgetary situation continues to be a cause for global concern, the current account of the US balance of payments has significantly improved. This means that the US has less need to attract capital inflows from abroad, putting less pressure on world savings. As with the UK, the improvement in the balance of payments owes something to the economic recession in the US. However, the position of the US differs significantly from the UK in that, at current exchange rates, the US industrial sector is reasonably competitive on world markets. The balance of payments should continue to improve leaving scope for a recovery in the US economy into the medium term.

The fall in economic activity within the US, together with the improvement in the balance of payments, has put less pressure on funds allowing domestic interest rates to fall. As stated above, for the future we expect the problems in the German economy to lead to some strengthening of the US dollar *vis-à-vis* the DM in the next five years. However, if the US currency were to strengthen by more than we have assumed one could see a return to the competitiveness problems which faced the US in the mid to late 1980s.

3.2.4 The Common Agricultural Policy

The Common Agricultural Policy (CAP) is currently in crisis because the volume of production within the EC, together with imports, has risen well above EC consumption and the costs of selling the surplus on world markets have exhausted the EC budget. The long-term solution to this problem remains a matter for lively debate within the EC. In the central forecast in this *Review* we have assumed that the CAP continues very much as before, but with only a very small increase in nominal prices in the foreseeable future. In spite of the effective price freeze, this approach would, in the short term, require additional funding for the CAP.

The article by Fitz Gerald and O'Connor in this *Review* considers the likely effects on the Irish economy of one set of proposals for reform of the CAP contained in a leaked EC Commission document. This article suggests that, if these proposals were implemented, holding the debt/GNP ratio unchanged (i.e. at the level forecast in our central projection described in the next Chapter), they would reduce the volume of GNP by between 1% and 1.5% in the medium term. They would also knock up to 1 percentage point a year off the rate of inflation over a period of five years. If the draft reform package were implemented this would mean that the growth rate in the medium term would be at least 0.25 percentage points below the level in the central forecast described in Chapter 4, and the rate of inflation would be reduced by twice that amount.

However, as discussed in that article there are a range of possible solutions to the crisis in the CAP. The final resolution of this problem will involve lively political debate, not just within the EC, but also involving all the participants in the General Agreement on Tariffs and Trade (GATT). It will also be affected by developments in Eastern Europe as the EC has an active interest in the economic development of that region.

3.2.5 Other EC Developments

In the last *Review* we published a detailed study of the likely effects of 1992 on the Irish economy. Part of the growth in investment in the industrial sector in 1989 and 1990 must be attributed to the anticipation by foreign firms of the effects of 1992, which undoubtedly imparted a new impetus to developments within the EC. The central forecast in Chapter 4 takes into account the major changes in the EC likely to arise from the completion of the EC market.

However, there are a number of key areas where the impact remains uncertain. In our previous assessment we estimated that the opening up of public procurement would be very important for Ireland. While the EC plans still call for such a development, it is unclear how effective they will be. In our central forecast in Chapter 4, we have assumed that it is not fully effective in the period to 1996. If it were successful there would be some additional growth in the high technology sector in Ireland in the mid-1990s over and above our benchmark projection.

There remain some aspects of the completion of the internal market which have still to be resolved, in particular the details of tax harmonisation. Some potential problems have been removed due to changes in the proposals on VAT administration. However, it is not clear how practical the current proposals are. In this *Review* we have assumed that Ireland can sustain a standard VAT rate 1.5 percentage points above the UK level. It is also assumed that Irish excise rates for key products (beer, spirits, and petrol) are harmonised to UK levels by 1993.

The plans for the EC Community Support Framework (CSF), initiated as part of the 1992 process, are currently being implemented. They have provided for a major increase in public investment as well as an expansion of schemes in the education and manpower area. The benefits of these changes on the demand side of the economy are already being seen. Public investment is growing and the transfers from the EC have helped increase the balance of payments surplus. However, the objective of the CSF is increase the productive potential of the Irish economy, not to provide an income transfer. This supply side impact of the CSF is not likely to be seen until the middle of the decade at the earliest.

In a separate study to be published over the summer, we have undertaken a comprehensive analysis of the likely impact of the CSF on the Irish economy. (Bradley, J., J. Fitz Gerald, and I. Kearney, 1991: *The Role of the Structural Funds: Analysis of Consequences for Ireland in the Context of 1992*, The Economic and Social Research Institute, Policy Research Series, forthcoming.) This study concentrates on the supply side impact of the CSF and provides a quantification of its impact

on the economy in the period to the end of the century. We have incorporated the planned CSF financed increase in government investment in 1992 and 1993 into our benchmark forecast and have assumed that after 1993 the size of support for the Irish economy from the CSF will remain fixed in real terms at the 1993 level. To achieve such a continuation of support or even increase it may be difficult in the face of the growing problems in Eastern Europe.

Since our last *Review* there has been a new development in the growing impetus to economic and monetary union (EMU). If successful the process of EMU will further change the operating environment for the Irish economy. Monetary union on its own will result in a convergence of Irish to German interest rates. While this process has already begun, in the absence of full union, domestic interest rates are likely to remain slightly above German rates for the foreseeable future. When consummated, monetary union will reduce interest rates to German levels. One of the costs of monetary union will be the loss of control over domestic monetary policy. However, for Ireland and other small countries this independence has proved largely illusory in the past.

In this *Review* we have assumed that EMU does not occur till the end of the decade. As a result, Irish interest rates, while converging towards German levels, remain a minimum of 0.5 percentage points above German rates. Given the assumed profile for German rates this will allow some reduction in domestic rates in the period to 1993. However, for the reasons outlined above, they will remain well above the levels which might have been anticipated in the absence of German unification.

3.2.6 The International Context for Ireland

The external environment for the Irish economy is somewhat less favourable than we anticipated in our last *Review*. As shown in Figure 3.3 the expected recovery in industrial output in the UK will be particularly weak. While somewhat stronger in the US, due to its improved competitive position, it will remain weaker than the recovery of the mid-1980s. In Germany, assuming that current policies are successful, growth is forecast to remain reasonably strong for the next few years.

Figure 3.3
Industrial Output

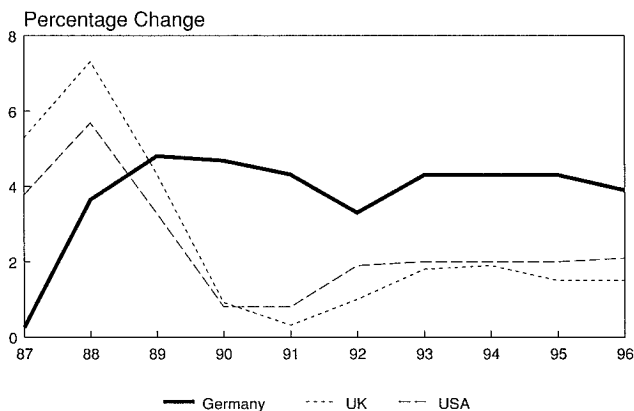
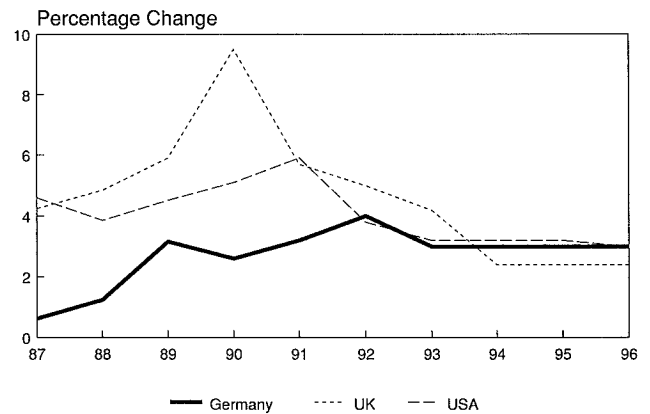
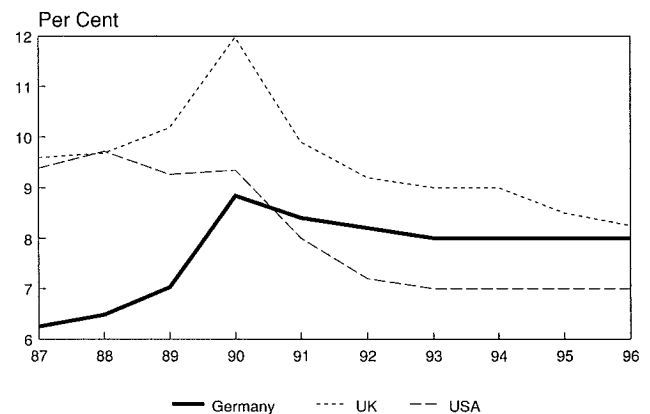


Figure 3.4
Consumer Prices



In the case of inflation (Figure 3.4) we see the German performance deteriorating temporarily as a result of the pressures of unification. In the UK, on the other hand, the rate of inflation is likely to fall quite rapidly. If it does not do so, the UK recession will be longer than anticipated. The US rate of inflation is forecast to show some improvement in 1992 and to remain relatively low in the medium term. The price of energy is assumed to grow by around 2% a year in real terms over the forecast period. Starting from its current position the Irish economy is quite competitive on its major markets.

Figure 3.5
Interest Rates



The outlook for interest rates was discussed above and is summarised in Figure 3.5. Finally, the prospects for the UK labour market, which will have a major bearing on the level of emigration, were summarised above in Figure 3.2.

There remain a number of areas of great uncertainty in the world forecast outlined above. It is quite possible that the problems of integrating Eastern Europe may prove more intractable and, hence, more expensive than envisaged. This could put further upward pressure on interest rates. In the case of the UK economy, failure to respond to the new operating environment of the EMS could prolong the current recession into 1992 or 1993. In the case of the US, while the recovery from recession faces better prospects than in the UK, the continuing failure to master the problem of the government deficit

could pose serious dangers in the medium term. As always, any serious problems for the US could translate into problems for other developed economies.

3.3 DOMESTIC ASSUMPTIONS

In this Section we set out our assumptions concerning domestic fiscal and monetary policy and likely demographic trends over the rest of the decade. In the case of domestic policy the assumptions are not intended to be in any way prescriptive. Instead we use a stylised set of assumptions based on policy indexation. This is intended to characterise what would happen if there were no change in tax or expenditure policies in the medium term. The assumptions have been modified to take account of the pay commitments under the Programme for Economic and Social Progress (PESP) and of developments inherent in the completion of the EC internal market.

3.3.1 Fiscal Policy

Underlying our assumptions concerning fiscal policy in the medium term is the accepted principle of indexing all nominal instruments and leaving all real instruments unchanged. This underlying approach has been substantially modified to take account of some of the longer-term commitments on fiscal policy.

On public service pay we have provided for the likely increases which will arise as part of the PESP in 1992 and 1993. In addition to the basic increases, we have assumed that all special increases likely to arise as a carry-over from the Programme for National Recovery (PNR) and as part of the PESP will be paid. These special increases are very substantial; their total cost over the period 1991-93 will be close to the cost of meeting the basic increase provided under the agreement. The effect of the combined increases will be to raise public service pay rates by between 8% and 9% a year over the period 1991-93. The policy implications of these very large special increases are dealt with later. For the period after 1993 we have assumed that public service pay rates show the same growth as pay rates in the private sector.

Employment in the public sector is assumed to grow at around 1% a year over the forecast period. However, a more rapid rise in earnings in the public sector will mean that the share of public consumption in GNP will remain largely unchanged.

The EC Community Support Framework provides for further significant increases in the volume of public investment in 1992 and 1993. Part of the funding for these schemes will be provided by the EC and will involve increased transfers from abroad in the balance of payments.

The underlying stance on taxation is the assumption that rates and bands will be indexed each year to prices. However, there are two special factors which must be taken into account: tax harmonisation and commitments on reducing tax rates in the medium term.

While the problems posed for Ireland by the need to harmonise indirect taxes have been reduced by the tax increases announced in the recent UK budget, they remain substantial. We have assumed that the standard Irish VAT rate will be reduced to 19% by 1993 and that the rates of excise tax on alcohol and petrol will be brought close to UK levels by the same date. In addition, while it has received less attention, there will have to be a major change in the Deposit Interest Retention Tax (DIRT). While we have assumed that some of the costs involved in these changes will be made good by increases in both direct and indirect taxes they will still represent a substantial loss of revenue for the exchequer. (We have not provided for any compensation which the EC might provide to ease the problems of harmonisation.)

As a result of the loss of revenue from tax harmonisation and the generally tight budgetary situation, we have assumed that there will be no scope for major cuts in income tax rates up to 1993. From 1994 onwards we have assumed a small fall in rates of direct taxation (including social insurance contributions) each year for the rest of the decade. This fall is additional to the provision for full indexation and would, in 1994, cost around £30 million.

While the government has committed itself to reaching a debt/GNP ratio of 100% by 1993, as discussed later, this is unlikely to be achieved without a significant policy change on expenditure or taxation (excluding receipts from privatisation). The need for such a policy change is discussed later and the benchmark projection takes account of the rather stylised policy stance outlined above.

3.3.2 Monetary Policy

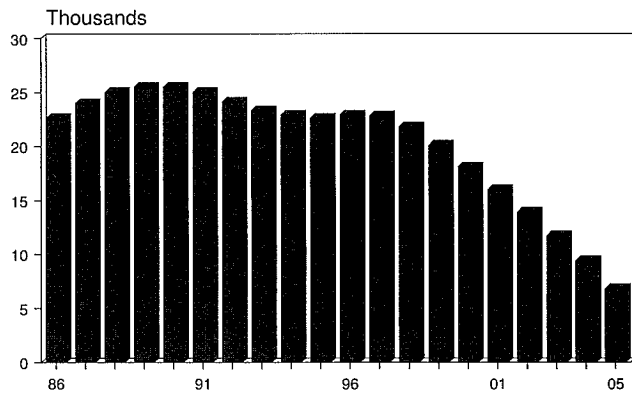
The advent of EMU will remove even the illusion of an independent Irish monetary policy. Until EMU is finally implemented it is assumed that the Irish Central Bank maintains a constant rate of exchange between the Irish pound and the DM for the rest of the decade. From 1993 onwards it is assumed that the margins for movement within the EMS are tightened so that the gap between Irish and German interest rates narrows further. The assumptions concerning German and EC monetary policy were discussed above.

3.3.3 Demographic Trends

Underlying developments in the labour market are changes in the population of working age. These changes are, in turn, a function of the natural increase (new entrants less retirements) and of migration, which is affected by economic circumstances and is discussed in the next Chapter. The rate of natural increase in the working age population is known with a reasonable degree of certainty for the next fifteen years based on the numbers born each year since the mid-1970s.

The birth rate peaked in 1980 so that we can predict a rapid fall in new labour force entrants early in the next century. Figure 3.6 shows that the numbers of potential new labour force entrants less retirements will average between 20,000 and 25,000 until nearly the end of the decade. (The forecasts in this figure are taken from J.J. Sexton, D.F. Hannan, B.M. Walsh and D. McMahon,

Figure 3.6
Potential Net Labour Force Inflows
1986-2005



1991, *The Economic and Social Implications of Emigration*, The National Economic and Social Council, Report No. 90.) The numbers will then fall rapidly to around 8,000 a year by around 2005 as the post-1980 cohort of births reach the age of entry into the labour force. This means that without emigration, even with no increase in labour force participation by married women, employment must grow by 1.5% to 2% a year even to provide jobs for the natural increase in the population. In addition, as we have assumed in this *Review*, there is likely to be some increase in participation in the labour force by married women.

Finally, the rate of growth in the active labour force in the 1970s and 1980s has been affected by increased participation in education. However, with the bulk of children now completing secondary education it is not clear to what extent this factor will moderate labour force growth in the future. We have assumed that any such change is small.

THE CENTRAL FORECAST

In this chapter we present our central forecast for the economy for the years 1991-96. The previous chapter gave details of the assumptions we have made concerning the world economy and the domestic policy environment. While in this chapter we present a single central forecast, it must be recognised that there is a wide margin of uncertainty concerning the external assumptions and how the Irish economy will react to changing circumstances. As a result, at the end of this chapter we present summary results for a number of additional simulations where we have examined the sensitivity of our central forecast to variations in our assumptions.

We take as a starting point the forecast for 1991 presented in the Spring issue of the *Quarterly Economic Commentary*. As a result, we do not provide any detailed commentary on the forecast for this year but concentrate instead on the prospects for the economy in the medium term.

In preparing this *Review* we have had the benefit of a new version of the ESRI Medium Term Model which allows us to examine in greater detail prospects for output and employment in the industrial and services sectors. However, as with previous versions of the *Review*, the model's results have been modified in the light of our judgement concerning changing patterns of behaviour in the Irish economy.

This chapter begins with a brief overview of the forecast. Because developments on the supply side are crucial in determining the growth potential of the economy in the medium term, we turn next to this aspect of the forecast. Sections 4.3 and 4.4 consider the prospects for wages and prices and for incomes. The expenditure side of the national accounts is considered in some detail in Section 4.5. We then discuss the balance of payments (4.6), the labour market (4.7) and

the public finances (4.8). Section 4.9 examines the prospects for the monetary sector of the economy, Section 4.10 examines the sensitivity of the central forecast to changes in certain key assumptions and Section 11 presents our conclusions. Detailed tables covering all aspects of the forecast are given in Appendix 1.

4.1 OVERVIEW

Table 4.1 gives details of the central forecast for certain key aggregates. This shows the Irish economy recovering in 1992 from a slow-down in 1991. It indicates that the economy will grow at around 3.75% a year in the period to 1996. This is slightly faster than the growth in the underlying productive capacity of the economy reflecting the recovery from lower growth this year. This rate of growth is somewhat below the forecast in the last *Review* due primarily to the deterioration in the prospects for world interest rates and the worse than expected performance of the UK and US economies. The rise in German interest rates due to unification will, on its own, reduce the average growth rate over the period by around 0.5% a year.

The industrial sector remains very competitive on its key export markets and the prospects for wage inflation in the market sector remain satisfactory. However, the downward revision in the forecast medium-term growth rate has a consequence for employment. It is now expected that total employment will grow by just under 1% a year over the next five years leading to an increase in employment of 51,000 by 1996.

This rate of growth in employment will be greater than that attained in the past five years. For many countries it would be regarded as quite satisfactory, but it will still not be sufficient to absorb the rapid

TABLE 4.1: Central Forecast - Major Aggregates

	1988	1989	1990	1991	1992	1993	1994	1995	1996
GNP % Change	1.4	5.0	6.1	2.0	3.7	4.3	3.3	3.6	3.7
Balance of Payments, % of GNP	2.3	1.8	2.9	1.9	2.0	1.8	2.1	1.9	1.9
Exchequer Borrowing Requirement, % of GNP*	3.3	2.3	2.0	1.9	2.9	2.6	2.2	1.9	1.4
Debt/GNP Ratio	130.4	119.4	111.8	108.4	105.6	101.8	99.5	96.4	92.6
Total Employment, Thousands, April	1091	1090	1120	1123	1136	1151	1158	1167	1174
Unemployment Rate %	16.7	15.7	14.0	15.8	15.9	15.7	16.0	16.0	16.0
Consumer Prices %	2.5	3.9	2.9	2.7	2.4	2.6	3.0	3.1	3.1

* Includes receipts from privatisation

increase in the labour force over the period. The scope for emigration has been greatly reduced by the deterioration in the UK labour market which is likely to remain unfavourable for Irish emigrants until at least 1993. As a result, emigration this year will be very low and the increase in the labour force will show up as an increase in unemployment. We forecast that the unemployment rate will continue to rise slowly up to 1996.

The annual rate of inflation, currently running at 2.7%, may fall further next year. However, this is likely to be only a temporary reduction as the expected rate of inflation in our trading partners is running at a higher rate. In the medium term the Irish inflation rate should approach the forecast German rate of 3%. The rate of increase in wage rates in the market sector is expected to average just over 5% over the period, allowing the industrial sector to maintain its competitive edge.

The balance of payments is forecast to remain in surplus throughout the next five years. This surplus will underpin the economic recovery and will facilitate the convergence of Irish towards German interest rates.

The rise in the forecast long-run real rate of interest has an adverse impact on the prospects for the public finances. While it makes debt reduction more urgent it also makes it more difficult to achieve, both directly, by raising interest payments, and indirectly by reducing the rate of growth. In addition to the higher interest rates, there are a number of other factors affecting the public finances which give cause for concern.

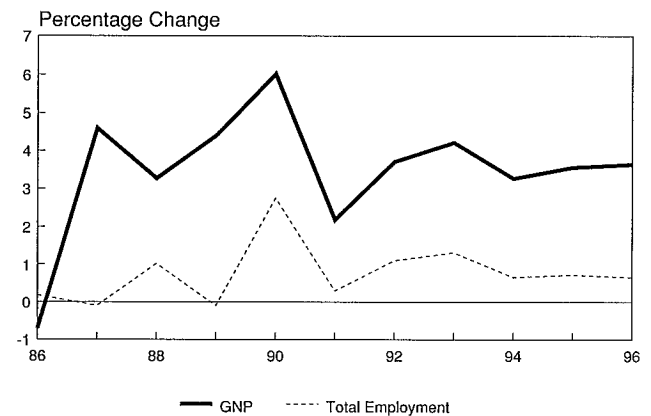
The rate of increase in public service pay is very high. The imperative of tax harmonisation still requires further action. The opening position in 1992 for the exchequer borrowing requirement has been adversely affected by unduly lax budgets in 1990 and 1991. As a result, on unchanged policies, the exchequer borrowing requirement, which is held down in 1991 by the receipts from privatisation, will rise in 1992. While the debt/GNP ratio should fall steadily over the next five years, it will still be above 90% in 1996.

4.2 THE SUPPLY SIDE

Following four years of rapid growth when the economy bounced back from the deep recession of the 1980s, the rate of growth this year has fallen back to 2% (Figure 4.1). This slow-down is a result of the recession in the US and UK economies and does not reflect a fall in the output potential of the Irish economy. Some slow down after the recovery years was inevitable as capacity utilisation rose in industry. For the next five years the output potential of the Irish economy should allow a growth rate of a little over 3.5% a year without encountering any capacity constraints. This growth in output will result in an increase in employment of just under 1% a year for the next five years.

We now analyse the prospects for output growth in each of the main sectors of the economy.

Figure 4.1
GNP and Employment



4.2.1 The Industrial sector

In our last *Review*, published in 1989, we suggested that the environment in the 1990s would be more favourable for domestic firms operating in traditional branches of industry than was the environment in the 1980s. However, we were unable to quantify this advantage as we had to treat the industrial sector as a single aggregate.

Since 1989 we have developed our model so that we can examine trends within the industrial sector. In this *Review* we consider the prospects for a five way break-down of the industrial sector: high technology manufacturing, food processing, traditional manufacturing, building, and utilities.

The high technology sector includes engineering and computers, chemicals and pharmaceuticals; the traditional manufacturing sector contains those sub-sectors not included under food processing or high technology. It includes a wide range of sectors including wood and furniture, building products, clothing and textiles, paper and publishing.

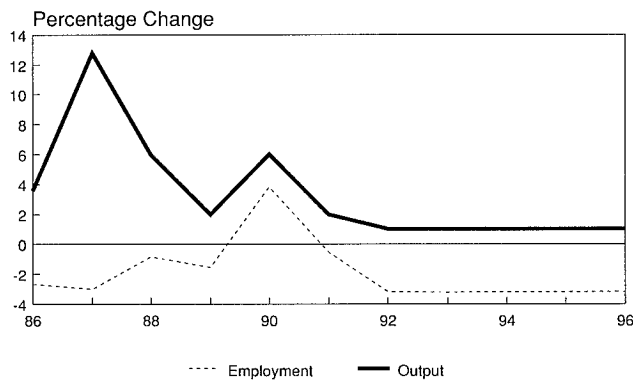
Food Processing

The food processing sector is treated separately because it is intimately related to developments in agriculture. It depends on agriculture to supply the vast bulk of its raw materials and the market conditions which it faces are greatly influenced by developments in the Common Agricultural Policy (CAP). The sector is also largely Irish owned with over 75% of the output of the sector being produced by Irish owned firms in 1987.

The major problem the food processing sector faces in the next five years is the crisis in the CAP. As discussed elsewhere in this *Review*, the current approach to reforming the CAP involves increasing use of quotas to restrict output. The food processing sector is thus constrained in the volume of inputs that it can obtain. It also suffers from serious seasonality problems. Finally, in a regime where intervention and heavily subsidised sales to third world countries provide the major market, there is little incentive to increase value added. As a result, unless the recent changes in structure in the industry can help it break into new EC markets, it is

likely to show only a small increase in output each year. For the next five years this increase should average around 1% (Figure 4.2).

Figure 4.2
Manufacturing
Food Processing



It is widely recognised that there is spare capacity in the food industry. As a result, given no major change in throughput, rationalisation can be expected, resulting in a loss of up to 5,000 jobs over the next five years. The only prospect for preventing this decline is for the industry to penetrate more profitable EC markets and increase its value added.

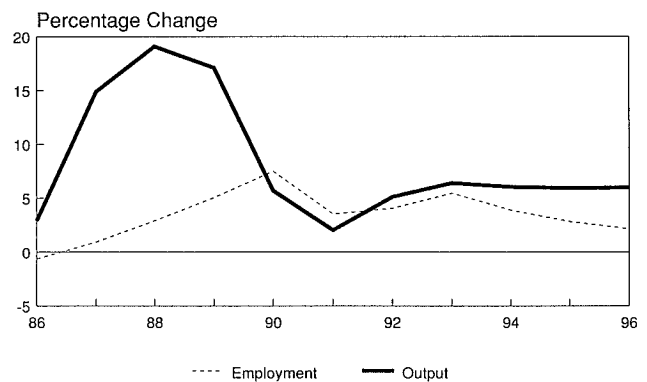
High Technology

The high technology sector is predominantly foreign owned; in 1987 over 80% of the sector's output was accounted for by foreign firms. Exports also accounted for 80% of its total output. Given the high profitability of this sector this means that a large part of the domestic value added leaks out in profit repatriations. The sector has grown much more rapidly than the world economy over the 1980s and a separate study has indicated that it is less directly affected by Irish cost competitiveness than is the traditional sector. The major factor behind Ireland's increasing penetration of this market in the 1980s was initially Ireland's favourable corporate tax regime. More recently, the availability of a skilled labour force has also played a role.

Experience in the past has shown that the future growth of the US firms in this sector depends on the competitiveness of the US economy on the EC market. If our assumptions concerning movements in exchange rates prove correct, their competitiveness should be maintained.

Growth was extremely rapid in the 1980s for the high technology sector in spite of the unfavourable circumstances in the wider Irish economy. It now accounts for almost 45% of the output of manufacturing and around 35% of employment. However, as the sector has grown in importance the rate of growth inevitably shows signs of slowing. While the average growth in output between 1987 and 1991 was over 10%, the central forecast shows output growth averaging only 6% over the next five years (Figure 4.3). This slow-down partly reflects the maturing of the sector and partly the somewhat slower growth in the outside world.

Figure 4.3
Manufacturing
High Technology



While the rate of growth in the high technology sector will decelerate, the absolute growth in employment of 17,000 in the sector in the next five years will be close to the growth of 15,000 experienced since 1986. The prospects for this sector could be improved by a number of factors.

If there were vigorous enforcement of the 1992 provisions on freeing public procurement there could be additional growth in the telecommunications equipment and health care industries. However, until the success of such measures are proven, foreign companies in the relevant high technology areas may remain reluctant to expand in Ireland.

Perhaps more important is the potential growth in the output of the aeronautical engineering industry, servicing aircraft. As this industry is fairly labour intensive and largely Irish owned, growth in the next five years could make a disproportionate contribution to the economy relative to the rest of the sector.

Traditional Manufacturing

The traditional sector has changed significantly over the past twenty years with many firms closing down in the 1980s. By 1987, 46% of the sector's output was accounted for by foreign firms. However, profitability in the sector is lower than in the high technology sector so that it generates a smaller volume of profits. As a result, profit repatriations are less important. It is also much more dependent on the home market: only 40% of output was exported in 1987. The sector was also more dependent on the UK for its export sales than was the high technology sector. It is the most sensitive of the three sectors to Ireland's competitiveness on the European market.

The traditional sector of manufacturing underwent major trauma in the first half of the 1980s when output fell by 1.2% a year. As a result, total employment fell by 23,000 between 1980 and 1985. While world recession and the severe turn-down in the Irish economy were important factors in this upheaval, the sector also suffered a major loss of competitiveness over the same period.

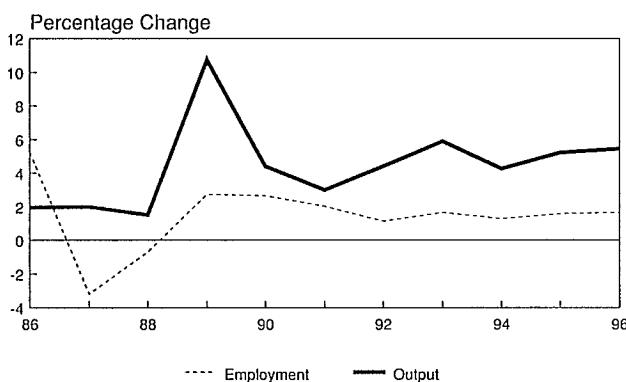
Since 1986 this loss of competitiveness has been reversed. The slow-down in the domestic rate of inflation, combined with the movement in the exchange rate, has resulted in a major improvement in competitiveness on both the UK and EC markets. Figure 4.4 shows the relative growth in labour costs in manufacturing in Ireland compared to the UK and Germany, all in a common currency.

The improvement has not been confined to labour costs. Trends in the cost of capital, which are important to this sector, have moved favourably over the period, due to the decline in interest rates. The relative cost of other domestic services, used by industry, has also improved. When we published our last *Review* we signalled this improvement but expressed the fear that it might not be maintained. Experience has proved these doubts groundless.

Figure 4.4
Relative Wage Rates
Common Currency



Figure 4.5
Manufacturing
Traditional Sector



For the next five years we show this sector maintaining its current competitive position. As a result the sector should grow at around 5% a year, broadly in line with the experience since 1987 (Figure 4.5). However, the growth in employment is likely to remain slow, 1.4% a year or 8,000 over the five years, reflecting the continuing growth in productivity. This is in line with the experience of the sector since 1987. However, there remains the possibility that the sector will capitalise more effectively on its competitive position and show more rapid growth than forecast. As against that, the

sector is more dependent on the UK market than the rest of manufacturing and it could suffer from any postponement of recovery in that economy.

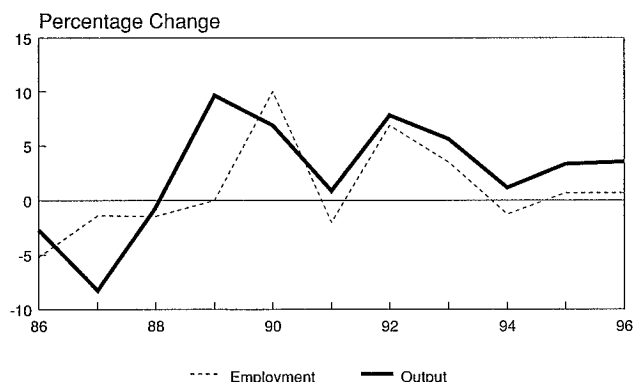
As shown in Table 4.2, the combined effect of developments in these three sectors will give rise to a growth in the volume of value added in manufacturing rising from 4.2% in 1992 to average around 4.5% a year over the next five years. The growth in the volume of gross output over the same period will be slightly slower at 4.3% a year.

Building

Unlike the manufacturing sector, the growth in the building industry is largely determined by domestic demand. If the industry runs into capacity constraints it raises its price, and profitability, to equate demand with its output capacity. In our last *Review* we expressed the fear that the rapid growth in the economy, together with the EC CSF funded investments, could have resulted in such excess inflation in the sector. However, a rephasing of the CSF and the rise in interest rates in the EMS avoided that danger resulting, in fact, in a minor recession in the industry in 1990-91.

A further increase in CSF funded investment combined with the start of construction on the gas inter-connector with the UK should provide an initial boost to investment in the sector in 1992. In addition, we envisage a pick up in investment, in particular in the industrial and housing sectors, giving rise to a substantial growth in demand for the sector's output in 1992. Over the next five years gross output in the sector could show an average growth rate of 4.3% (Figure 4.6) a year while the growth in value added could be between 2.5% and 3% per annum. The difference between these two measures arises from a more rapid growth in the use of material inputs in the sector. Employment growth in the sector could average 2.25% a year.

Figure 4.6
Industry
Building



The precise timing of investment is always the most difficult component of GNP to predict so that the path of output growth in this sector in the medium term remains uncertain. However, our central forecast suggests a significant recovery next year continuing into 1993. Thereafter there could be some slow-down as the stimulatory effects of the EC CSF end and as work on the gas inter-connector is completed. The pattern of

employment growth reflects the time path for output with all the growth occurring in 1992 and 1993 and employment remaining static thereafter.

Utilities

The utilities sector accounts for under 7% of value added in total industry. The growth in the volume of output in that sector over the next five years will average around 4.5%. The growth in the volume of value added may be slightly higher.

The likely growth in output of the aggregate industrial sector over the period to 1996 will follow closely the time path of its biggest sub-sector, manufacturing, rising at around 4.5% a year on average. This represents a slow-down compared to the 7.4% a year experienced between 1987 and 1991. This slow-down can be attributed to the disimprovement in the growth prospects for our major trading partners, the high real rates of interest and the exceptional circumstances of the recovery years 1987-89. Growth in 1992 may be somewhat below the average due to the gradual recovery from the slow-down in 1991. The growth in employment in the sector will be slightly slower at 1.7% a year than the 2% a year experienced between 1987 and 1991.

This forecast for the industrial sector represents the mid-point on a wide range of possible forecasts. There are as many reasons to expect the forecast to prove unduly optimistic as there are to expect it to prove pessimistic. On the down side there is the possibility that world growth could prove substantially slower in the next five years than we have forecast. As against that, there is the possibility that the traditional manufacturing could respond more vigorously to its favourable competitive position and the food sector could break new ground in profitable EC markets increasing its value added. These issues are taken up again in Section 11.

4.2.2 The Market Services Sector

The market services sector is the largest single sector of the economy. However, it contains within it a great diversity of different kinds of enterprise. These range from highly capital intensive traded enterprises, such as air transport, to non-traded, low physical capital personal services. With the help of the CSO we have been able to split up market services into three sub-sectors: distribution, transport and communications and other professional and financial services. This breakdown facilitates an understanding of the processes likely to drive market services over the next five years.

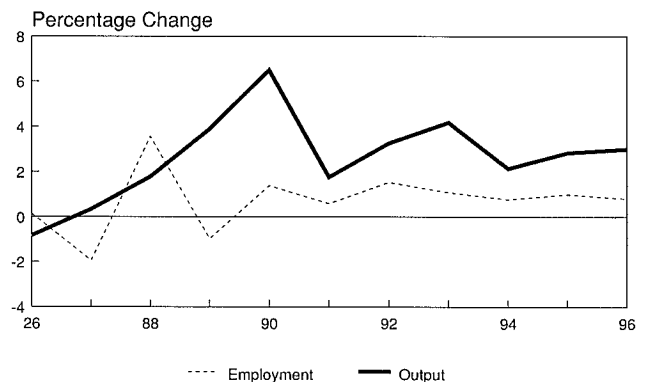
The distribution sector has undergone substantial structural change over the last twenty five years with the growth of supermarkets, the rise to prominence in the grocery trade of a small number of multiples, and the reduction in importance of the independent wholesale function. The completion of the EC market by 1993 will have important implications for the way this sector operates. (J. Fitz Gerald, 1989: "1992: The Distribution Sector", in *The Economics of 1992*, The Economic and Social Research Institute, Policy Research Series, Paper No. 10.) However, while these changes will result in some increase in efficiency of operation there are likely to be other forces giving rise to increased demand for the services of this sector. As living standards rise, higher standards of service are sought by consumers

which involve higher margins. In the UK in the 1980s there was an increasing trend to compete on service rather than on price.

Distribution

The result of these offsetting changes will be a fairly slow growth in the output of this sector, roughly in line with the growth in consumption (Figure 4.7). This would be a somewhat better performance than in the 1980s when output in the sector actually fell, in spite of a small rise in consumption.

Figure 4.7
Market Services
Distribution



Employment in the sector in the 1980s actually increased. However, these figures mask a substantial shift over the period from full-time to part-time workers. With an improved output performance in the next five years employment is forecast to grow by 1% a year. If the shift to part-time working continues the measured growth in employment could be slightly higher.

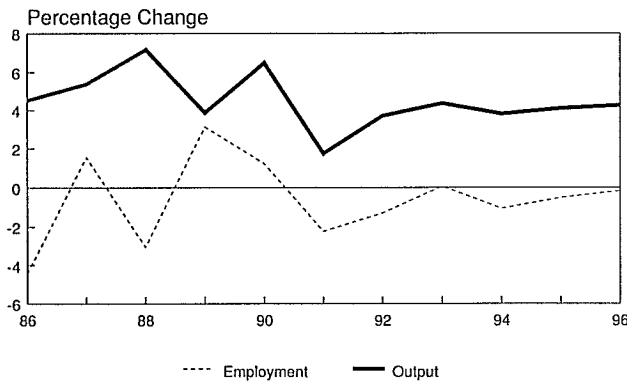
Transport and Communications

The transport and communications sector grew by 5% a year from 1983 to the end of the decade (Figure 4.8). This growth was driven by the rapid increase in exports, in particular tourism exports, and by increases in capacity in the telecommunications sector. In the latter case, the low investment in the 1970s had constrained output so that the sector was operating below its optimum level. (Bradley, J., J. Fitz Gerald, and I. Kearney, 1990: "A Model of the Irish Marketed Services Sector", The Economic and Social Research Institute, Report for DG XVI of the EC Commission.) The fall in air fares, consequent on increased competition, helped increase the demand for the services of this sector.

For the next five years the prospects for the tourism industry remain bright and the telecommunications industry should have the capacity to meet demand for its services. As a result we forecast that the output of this sector will grow by about 4% a year in the period to 1996.

Employment in this sector fell by 3,000 between 1980 and 1990 in spite of the rapid growth in output. This reflected extensive rationalisation in the telecommunications sector and a considerable growth in productivity. This sector is highly capital intensive and there has been significant substitution of capital for labour in communications. This trend is likely to con-

Figure 4.8
Market Services
Transport & Communications



tinue over the next five years so that we forecast a further fall in employment in the sector of 2,000 between 1991 and 1996.

Professional and Financial

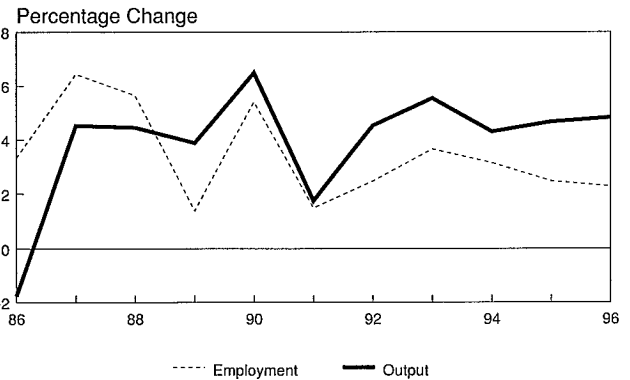
The professional and financial sector is the least homogeneous of the services sectors which makes modelling and forecasting less certain. The financial services sub-sector has grown in importance over the last twenty years. Between 1970 and 1990 employment in financial services more than doubled. However, financial services still accounts for less than a quarter of the employment in the sector. The sector, which includes hotels and catering, has benefited from the growth in tourism in recent years. For the rest of this sector the growth in domestic demand is the major driving force.

Experience elsewhere has been that rising living standards result in an above average growth in the demand for certain services, especially the services of this sector. In spite of the recession, over the period 1980-89 the sector grew by 3% a year (Figure 4.9). For the next five years we forecast a rise in the volume of output of on average 4.7% a year. This growth will be fuelled by the growth in domestic demand and by a continuing, though less rapid, growth in the volume of tourism exports.

The rapid employment growth in this sector in the 1980s contrasted with the dismal performance elsewhere in the economy. Over the period 1980-90 employment grew by 47,000, an average of 2.7% a year. For the next five years we are forecasting an almost identical rate of growth. Given the higher rate of growth forecast for the output of this sector, this implies an increase in the rate of productivity growth as more of the growth of the sector comes from the less labour intensive services.

Taken together, the market services sector will grow by about 4.2% a year over the next five years. This is a slightly higher growth rate than that forecast for GNP over the same period and it mirrors the experience in the 1980s.

Figure 4.9
Market Services
Professional & Financial

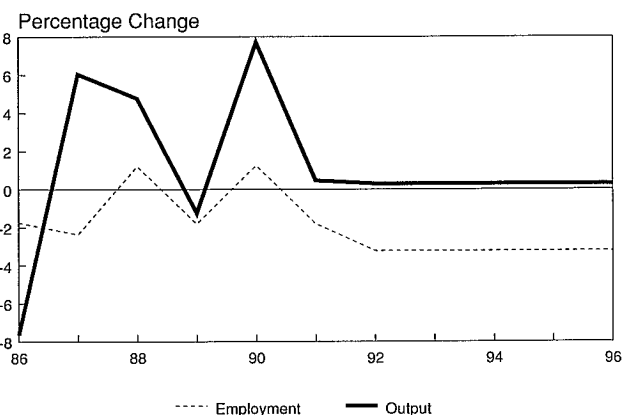


4.2.3 Agriculture

In a separate article in this *Review* we examine the possible effects on the Irish economy of a major reform in the CAP. However, in the absence of firm decisions on how such a reform should proceed we have incorporated a stylised projection for the agriculture sector, taking account of recent trends in the CAP.

We have assumed that real prices for agricultural output fall by between 1.5% and 2% a year over the next five years. This reflects the need to squeeze profitability continuously to prevent surpluses rising uncontrollably. In addition, we have assumed that quotas are either cut or their coverage extended to hold the volume of gross output in the sector unchanged at the 1991 level. On this basis, value added in agriculture, forestry and fishing is forecast to grow by around 0.3% a year (Figure 4.10).

Figure 4.10
Agriculture



This is in marked contrast to the performance over the period 1980-90 when value added grew by 2.8% a year. However, given the crisis in the CAP we feel that even without a major reform, it would be unrealistic to expect significant output growth to be permitted in the face of mounting surpluses. This turn-around in the prospects for the volume of output of the sector has serious consequences for the food processing sector, as discussed above.

**TABLE 4.2: Output: GDP at Factor Cost
Constant Price % Changes**

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Agriculture	4.8	-1.3	7.7	0.4	0.3	0.3	0.3	0.3	0.3
Industry	9.2	11.7	5.0	3.9	4.2	4.6	4.2	4.5	4.6
Manufacturing	12.2	12.7	4.7	4.2	3.9	4.5	4.7	4.9	5.0
Utilities	4.0	5.4	5.3	5.0	6.0	6.1	4.6	4.5	4.4
Building	-5.2	9.8	7.0	1.0	4.4	4.5	0.9	1.7	1.9
Market Services	5.5	3.9	6.5	1.7	4.0	4.9	3.6	4.0	4.2
Distribution	1.8	3.9	6.5	1.7	3.3	4.2	2.1	2.8	3.0
Transport & Communications	7.1	3.9	6.5	1.7	3.7	4.4	3.8	4.1	4.3
Professional & Financial	4.5	3.9	6.5	1.7	4.5	5.5	4.3	4.7	4.8
Non-Market Services	-4.3	-2.5	0.4	0.4	1.2	1.2	1.2	1.2	1.2
Health & Education	-3.7	-2.2	0.4	0.4	1.0	1.0	1.0	1.0	1.0
Public Administration	-5.5	-2.9	0.5	0.5	1.4	1.4	1.4	1.4	1.4
Adjustment for Fin. Services	5.1	6.1	1.7	3.8	5.4	6.2	4.9	5.3	5.5
GDP at Factor Cost	5.2	5.5	5.3	2.3	3.3	3.8	3.2	3.5	3.6
Taxes on Expenditure	2.5	1.1	4.5	2.0	2.6	4.7	2.3	2.7	3.0
Subsidies	-5.2	-3.3	2.7	1.0	1.2	1.8	1.0	1.2	1.3
GDP at Market Prices	5.5	5.3	5.3	2.3	3.3	4.1	3.2	3.5	3.7
Net Factor Income	23.0	11.4	1.0	3.2	0.6	3.1	2.6	3.1	3.7
GNP at Market Prices*	3.3	4.4	6.0	2.2	3.7	4.2	3.3	3.6	3.6

* The growth rate for 1991 at previous year's prices is 2.0%, as in the *Quarterly Economic Commentary*

Over the 1980s employment in the sector fell by around 4,500 a year. While employment in agriculture has proved very insensitive to profitability in the past we have assumed a slightly more rapid fall over the next five years of around 5,000 a year. By 1995 agriculture should account for just under 12% of total employment. This contrasts with the situation in 1980 when agricultural employment was over 18% of the total, illustrating its declining importance in the Irish economy.

4.2.4 The Public Sector

The growth in the output of the public sector is, by convention, almost totally determined by the rise in employment. Over the period 1981-86 output growth averaged 1.5% a year. From 1987 to 1989 there was a major fall in the output of the sector. As a result, the volume of output in 1989 was almost identical to the volume in 1981. In 1990 and 1991 there has been a small turn-around with employment increasing by around 0.4% a year. Part of this increase in output and employment is due to increased CSF funding for training.

For the next five years, growth in the public sector is assumed to remain low at just over 1% a year. With declining pupil numbers in education, together with increases in efficiency in other sectors, this should leave scope for some limited increase in the quality of public services. However, as discussed later, the scope for even such improvements may be affected by other developments on the public finances.

4.2.5 Total Output

The detailed forecasts for the individual sectors are summarised in Table 4.2. Taken together they result in a forecast for the growth in GDP at factor cost and market prices of an average of 3.5% a year for the next five years. Unlike the last *Review* we do not see any

reason for the growth rate to vary greatly from one year to another over the period to 1996. Unlike the experience after the 1980s recession, the recovery from the 1991 slow-down is likely to be reasonably steady but slow. In 1992 the growth rate of GDP should be around 3.25% rising to 3.8% in 1993. The fact that the 1991 slow-down in Ireland has been reasonably mild, and that the recovery in the UK in particular will be weak, gives rise to this more gradual recovery path.

The forecast trend growth for the next five years of 3.5% represents a reduction from the 4% of our previous *Review*, reflecting the much more adverse outlook for real interest rates, discussed in the last chapter, and the poor performance of the UK economy. While this reduction in the medium-term growth rate is very disappointing in the face of the high level of unemployment, it still represents a much more favourable outlook than the experience of the early 1980s would have suggested.

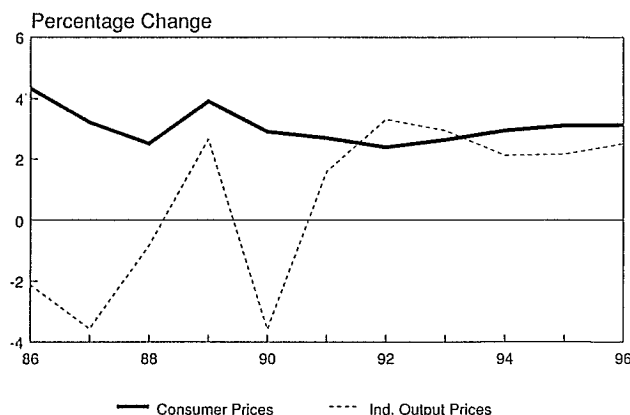
4.3 PRICES AND WAGES

Prices

The major determinants of the Irish rate of inflation in the long run are the rate of inflation in our major trading partners and the rate of exchange of the Irish pound. With the establishment of what is effectively a fixed rate of exchange within the EMS, the Irish rate of inflation should follow reasonably closely the rate of inflation of other EMS countries. As discussed in the previous chapter, we forecast a German rate of inflation of around 3% for the next few years. This is around 0.5% above the rate forecast in the last *Review* and the revision arises from the inflationary effects of German unification.

While the external rate of inflation is the long-run determinant of the rate of inflation in Ireland, special factors, such as changes in taxes, can lead to some divergence in the short run. In the case of output prices in the industrial sector we see the effects of more rapid inflation in the UK having some carry-over effect on Irish output prices, excluding the food processing sector. As shown in Figure 4.11 and Table 4.3 we envisage a rise in manufacturing output prices in 1992 of 3.3% falling to a little over 2% by 1994 as UK inflation falls towards the EMS norm.

Figure 4.11
Inflation



For consumer prices the continuing downward pressure on food prices will act as a moderating influence. In addition, while we have assumed that some of the costs of tax harmonisation are recouped from raising other indirect taxes, it will lead to a net loss of revenue to the exchequer and a reduction in consumer prices

below the long-run trend. Finally, if the PESP is effective in the private sector, as its precursor was in the 1987-90 period, the rate of increase in wages will be somewhat below the trend in some of our trading partners. This will reduce the inflationary pressures within the services sector.

The forecast growth in both the volume of GNP and of consumption makes it unlikely that there will be any build up in domestic inflationary pressures due to capacity constraints. Taken together these different factors should lead to a reduction in the Irish rate of inflation in 1992 and 1993 to around 2.5% a year from this year's forecast of 2.7%. From 1994 onwards it is likely that the rate of inflation in consumer prices will rise again towards the EMS norm of around 3%. While prices in the building sector showed a more rapid rise than consumer prices in the recovery years of 1988-90, as profit margins were rebuilt, we expect a more normal trend in the next five years.

As outlined in the article by Fitz Gerald and O'Connor on agricultural reform, any wide-ranging changes in the CAP could lead to a major drop in agricultural prices. This would tend to reduce the rate of inflation throughout the EC. However, because of the greater dependence of the Irish economy on agriculture the effects on the Irish inflation rate could be greater than for other EC countries. Thus there remains the possibility that CAP reform could reduce the rate of inflation in the next five years by between 0.5% and 1.0% a year below our central forecast. Much would depend on the way any reform package is implemented. While rates of inflation of below 2% in Ireland may seem unlikely, CAP reform could produce such a result, albeit for a temporary period.

TABLE 4.3: Price Deflators and Wage Rates (percentage changes)

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Consumption:									
Personal	2.5	3.9	2.9	2.7	2.4	2.6	3.0	3.1	3.1
Government - Total	4.9	6.2	8.3	9.1	6.8	6.9	4.6	4.8	5.2
Investment:									
Building	5.0	5.9	4.1	5.1	3.7	3.2	2.7	3.0	3.0
Machinery & Equipment	7.0	6.8	1.0	2.4	2.9	3.0	2.9	2.9	3.0
Exports:									
Agriculture	5.7	7.3	-6.2	-0.9	3.5	3.0	2.3	2.3	2.6
Industry	6.8	4.6	-6.0	-2.0	1.8	1.8	1.8	1.8	1.8
Services	5.9	8.6	-7.4	-1.2	4.0	3.4	2.4	2.4	2.8
Imports	2.2	3.9	3.4	2.7	2.4	2.6	3.0	3.1	3.1
Energy	6.3	6.7	-3.8	1.8	3.4	3.3	3.2	3.2	3.2
Non-Energy	-14.3	17.5	5.9	-1.8	4.5	4.5	4.5	4.5	5.0
Gross Output - Agriculture	7.3	5.7	-4.0	1.0	3.2	3.0	3.0	3.0	3.0
Gross Output - Manufacturing	8.2	5.0	-11.8	-4.4	1.0	1.0	1.0	1.0	1.0
Foreign in £IR									
German Output	-0.8	2.7	-3.6	1.6	3.3	2.9	2.1	2.2	2.5
UK Output	1.3	3.8	2.3	3.2	3.2	3.0	3.0	3.0	3.0
Average Annual Earnings									
Industry	11.6	3.9	-1.1	10.1	4.2	3.4	1.6	1.6	2.4
Market Services	4.7	3.8	4.1	5.5	4.8	5.3	5.1	5.3	5.8
Non Market - Public Admin.	3.8	4.2	4.8	4.7	4.8	5.5	5.3	5.3	5.9
Non Agricultural	0.0	10.3	8.3	9.1	8.0	8.0	5.1	5.3	5.8
	3.7	6.4	4.1	5.5	5.4	5.9	5.0	5.1	5.7

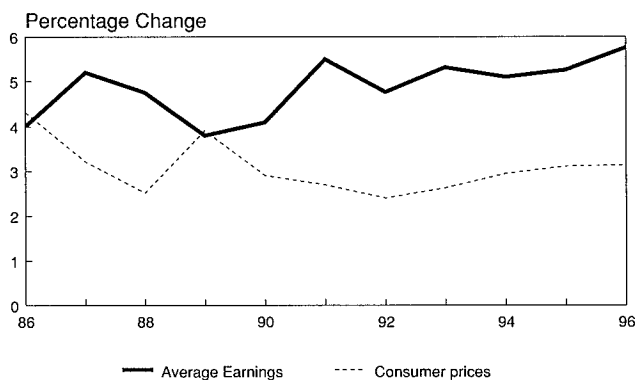
Table 4.3 shows the forecast growth in import and export prices over the next five years. While the export price will be bolstered in 1992 and 1993 by the rapid rise in UK prices, it is likely to rise by only 2.5% a year in the medium term because of the weighting of agricultural produce in the total. On the other hand, import prices will be boosted by the assumed real increase in the price of energy giving rise to an average growth rate of around 3.25% a year. Although less dramatic than the loss in 1990-91 there is thus likely to be a significant loss to Ireland arising from these adverse movements in the terms of trade.

Wages

Since 1985 average annual earnings in industry have grown by 4.5% a year (Figure 4.12). This represents a major change in behaviour compared to the previous fifteen years. The reduction in the rate of wage inflation was a major contributory factor to the recovery in the economy in the late 1980s and to the return to employment growth in industry. As indicated in the last chapter, there are a number of economic reasons why the rate of wage inflation has fallen. The Programme for National Recovery (PNR) and the PESP have reflected this change in behaviour.

The reduction in the rate of price inflation has obviously been important. The falling rate of increase in wages has, in turn, contributed to this lower rate of price inflation. In addition, as the government's debt problem was turned round and expenditure was cut, the burden of taxation stopped rising. Employees have reacted to both the reduction in inflation and the stabilising of tax deductions by moderating wage demands.

Figure 4.12
Wage Inflation
Industrial Sector



For the next five years we forecast a slightly more rapid growth in wage rates of an average of 5.2% a year. This will allow workers to share in the benefits of the increase in productivity. The forecast for unemployment, discussed later, will also exert downward pressure on the rate of wage inflation in the next three years.

In terms of competitiveness the rate of wage inflation will compare favourably with that in Germany and the UK this year and in 1992 (Figure 4.4). Thereafter, the slow-down in domestically generated inflation in those two countries could result in wage inflation falling below our forecast for the Irish economy. However, on

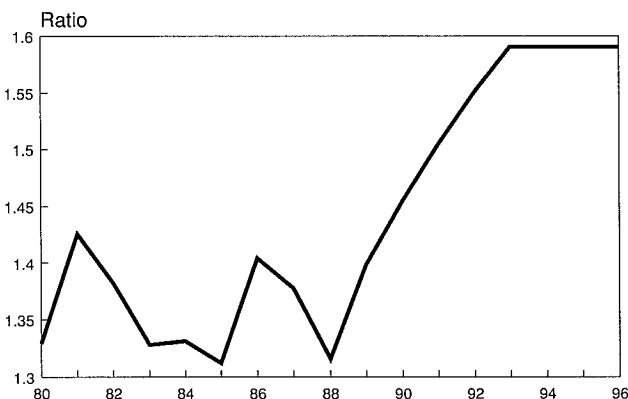
the central forecast, there is unlikely to be any significant deterioration in Ireland's competitive position before the middle of the decade.

Based on past experience we expect the rate of wage inflation in the industrial sector to be passed on to the market services sector so that average annual earnings in the two sector will rise at the same rate.

Our forecast for the public (non-market) sector is rather different. For 1991-93 we have assumed that wage rates rise in line with the terms agreed in the PESP. In particular, the agreement allows for the continued processing of claims for special increases in the public sector. As a result, we forecast that average annual earnings in the public sector will grow much more rapidly than in the rest of the economy. In 1992 and 1993 this will result in average earnings rising by around three percentage points a year more than in the private sector. Thereafter we have assumed that average earnings in the public sector will rise at the same rate as in other sectors of the economy.

The implications of this trend in public service pay for the public finances are discussed later. However, this pattern of growing differentials between average earnings in the non-market and the market sectors of the economy gives serious cause for concern. Figure 4.13 shows the ratio of average earnings in public administration to average earnings in industry. Over the period 1980 to 1985 there was relatively little change in this ratio. However, since that date, the rate of growth in average earnings in public administration has been much more rapid than in industry. To some extent the figures for the 1987-90 period have been biased upwards by the cost of redundancies and early retirements. Even allowing for this, the change in differential has been very marked.

Figure 4.13
Relative Average Earnings
Public Administration / Industry



The need to finance this diverging trend puts upward pressure on tax rates and, indirectly, raises wage rates in the market sector. However, there remains the danger that the higher rates of increase in the non-market sector could be passed on directly to the market sector. This could be very serious for employment growth and for the medium-term prospects of the Irish economy. As a result, it is urgent that measures be taken now to ensure that the diverging trend does not continue beyond 1993.

TABLE 4.4: Personal Income (percentage changes)

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Agricultural Incomes	17.0	4.5	-5.5	-8.0	-0.1	-0.3	0.3	0.4	0.2
Non-Ag. Wage Income	4.7	6.6	7.3	6.3	7.4	8.0	6.3	6.5	7.0
Transfer Income	2.9	0.8	4.4	6.5	3.9	3.8	4.0	3.8	3.8
Other Personal Income	-6.0	8.7	14.2	7.0	7.2	8.3	3.1	5.2	5.8
of which:									
Non-Ag. Profits etc.	11.1	14.2	10.4	3.5	7.2	8.7	4.3	5.9	6.8
National Debt Interest	3.6	0.9	6.7	2.4	-1.5	3.1	3.4	3.4	3.5
Net Factor Income	29.9	19.6	-5.3	2.2	4.1	6.2	5.0	5.5	6.5
Other Private Income	-1.4	8.7	22.4	2.3	6.4	7.9	2.9	4.9	5.5
Undistributed Profits (-)	12.1	8.6	42.6	-7.2	4.4	6.9	2.4	4.2	4.9
Personal Income	3.9	5.5	6.4	5.2	6.1	6.7	5.0	5.5	5.8
Taxes on Personal Income	11.6	-3.7	7.0	5.9	6.0	5.0	5.8	5.4	6.0
Personal Disposable Income	1.8	8.4	6.2	5.0	6.2	7.2	4.8	5.5	5.8
Personal Consumption	5.0	9.3	5.8	5.0	4.9	7.4	5.1	5.7	6.0
Personal Savings	-13.6	3.1	9.2	4.7	13.5	5.8	3.5	4.1	4.4
Tax Ratio (% Pers. Income)	23.5	21.4	21.6	21.7	21.7	21.4	21.5	21.5	21.5
Savings Ratio (% Disposable Income)	14.9	14.1	14.5	14.5	15.5	15.3	15.1	14.9	14.7

4.4 INCOMES

The forecast for the agricultural sector is gloomy so that farm incomes show little change in nominal terms over the forecast period. However, given the continued decline in employment in the agricultural sector there should be little change in real income per head.

As shown in Table 4.4, in contrast to the recovery phase of the Irish economy when profits grew much more rapidly than wages and salaries, they will grow at similar rates in the next five years. This reflects the changing pattern of growth with less dependence on the high technology sector. The traditional manufacturing sector, which is much more labour intensive than the high technology sector, will account for a higher share of the growth than it did in the recent past. This sector will, in fact, show an increase in profitability in the forecast period. Overall the competitiveness of the economy, measured by profitability, will be broadly unchanged.

Transfers, which are assumed to be indexed to consumer prices, will rise quite slowly over the next five years. There will be some additional growth over and above the rate of inflation to fund the higher level of unemployment. The rate of increase in national debt interest will also grow quite slowly reflecting the relatively small exchequer borrowing requirement.

The revenue from personal taxation is affected by two assumptions. In 1993 there is a halving of the DIRT tax because of the ending of exchange control and the resulting need for harmonisation with other EC members. From 1994 onwards there is assumed to be a small reduction in the average rate of tax each year (taxes divided by income). Taken together these will lead to a small reduction in the ratio of personal taxes to personal income.

The resulting rise in personal disposable income will be nearly 6% a year. When the rate of inflation is allowed for, this will give rise to an average growth in real personal disposable income of 3% a year for the next

five years. The reduction in DIRT in 1993 will result in a particularly big increase in real disposable income that year.

4.5 EXPENDITURE ON GNP

Consumption

One of the areas of greatest uncertainty in the past concerning the prospects for the Irish economy has been the behaviour of consumers. Over the last twenty years a number of different approaches have been taken to modelling the pattern of personal savings. However, as yet, no satisfactory explanation has been found for the observed behaviour of consumers. When we published our last *Review*, drawing on recent Danish and UK experience, we felt there was a possibility of a rapid fall in the savings ratio in 1990. However, on the data available, this does not seem to have occurred.

In the case of the UK in the 1980s the run-down in savings was accompanied by extensive financial deregulation, something which has not occurred to the same extent in Ireland. In addition, the rise in German interest rates in 1989, prompted by the Bundesbank, punctured the inflationary spiral in house prices and deflated consumer expectations. The action by the Bundesbank in raising interest rates was probably well timed from the point of view of the short-run behaviour of the Irish economy, though of course the consequences of higher interest rates in the medium-term are extremely adverse.

Given the uncertainty about consumer behaviour, for the next five years we have projected a broadly unchanged savings ratio. We do not envisage circumstances like those in early 1989, which gave rise to fears of too rapid a fall in the ratio. There may even be a small rise in the ratio in 1992 with interest rates remaining high. Thereafter we show the savings ratio falling slowly back to this year's level. The change in DIRT tax could result in a further temporary rise in 1993. However, here

TABLE 4.5: Expenditure on GNP (constant 1985 prices, percentage changes)

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Personal Consumption	2.4	5.2	2.8	2.2	2.5	4.7	2.1	2.5	2.8
Public Consumption	-4.2	-3.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0
Fixed Investment	2.6	12.0	5.4	3.6	7.3	5.2	1.9	4.0	4.0
Building	-0.7	9.7	6.9	0.8	7.8	5.7	1.2	3.4	3.6
Machinery	5.6	14.1	4.0	6.0	6.8	4.8	2.6	4.5	4.4
Total Domestic Demand	0.4	6.0	4.9	1.3	2.0	4.4	2.0	2.7	2.9
Total Exports	8.7	10.1	6.2	5.4	7.5	6.6	6.2	6.1	6.0
Merchandise	8.9	11.0	6.0	5.6	7.9	6.9	6.4	6.3	6.2
Services	6.8	2.2	7.6	4.1	3.0	3.3	3.1	3.4	3.5
Total Demand	3.9	7.8	5.5	3.2	4.5	5.4	4.0	4.4	4.4
Total Imports	3.9	10.9	5.6	4.4	6.3	7.3	5.1	5.5	5.5
Gross Domestic Product	3.9	5.9	5.4	2.3	3.3	4.1	3.2	3.5	3.7
Net Factor Income	23.0	11.4	1.0	3.2	0.6	3.1	2.6	3.1	3.7
Gross National Product*	1.4	5.0	6.1	2.2	3.7	4.3	3.3	3.6	3.7

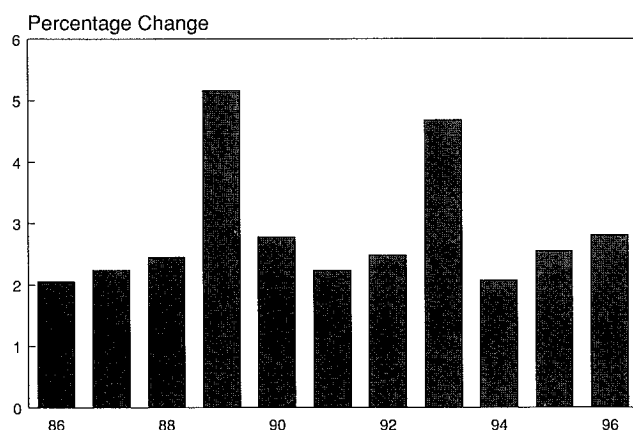
* The growth rate for 1991 at previous year's prices is 2.0%, as in the *Quarterly Economic Commentary*

we have assumed that consumers view income from deposits in the same way in which they view other forms of income and do not change their savings pattern.

In the longer term it should be noted that the personal savings ratio in Ireland is quite high compared to our European neighbours. While some of this difference may be explicable in terms of demographic factors there could be some reduction in the rate in the longer term.

Given the forecast for personal disposable income, we envisage a moderate growth in the volume of consumption over the next five years of nearly 3% a year (Figure 4.14 and Table 4.5). This is roughly in line with the experience since 1987. Because of the reduction in DIRT tax in 1993, together with a slight fall in the savings ratio, consumption growth in that year could peak at over 4.5%. However, as discussed above, consumers may spread out the effects of this tax change more evenly over time than we have forecast.

Figure 4.14
Consumption



The pattern of growth in public consumption is determined by our initial assumptions. The volume growth in this item is determined by the assumed growth in employment in the sector of 1% a year. This rate of growth is substantially below the average growth in public consumption over the 1980s.

While fiscal necessity may dictate a continuing fall in the share of public consumption over the next five years, it is not clear what will be the public preference in the longer term. It seems unlikely that the share of GNP devoted to demand for publicly provided goods - health care and education - will fall indefinitely. By the end of the decade a growth rate for this aggregate more in line with national income could be anticipated.

Investment

Of all the components of expenditure the most difficult to forecast in the short term is investment. This is not just due to problems with indicators of current activity but reflects the fact that investment is extremely cyclical. In forecasting in the medium-term more importance attaches to the investment over the whole period rather than to its precise timing. In using a model based approach it is possible to determine the change in the capital stock over a period of years necessary to underpin the forecast change in output capacity. However, the model is less reliable in forecasting the years in which the investment will take place.

While investment appears to have grown very rapidly in 1989 and 1990, when economic growth was particularly fast, the down-turn this year has seen a reversal in this trend. The recovery in the economy next year should see a return to growth in investment. Two special factors will help strengthen the 1992 recovery: CSF funded government investment and the building of the gas pipeline to the UK. However, the recovery should be fairly broadly based with significant growth in private housing, investment by the traditional and high technology sectors in manufacturing and in the market services sector.

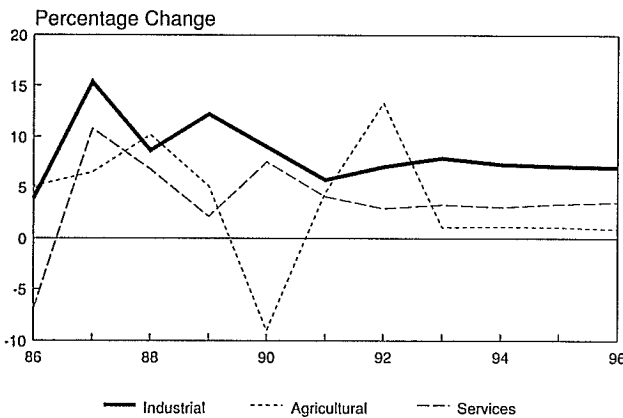
The fluctuations in investment in the years after 1992 owe much to the special factors adding to growth in 1992. In 1994 the growth in CSF funded investment is assumed to end and the gas pipeline should be completed. Over the five year period 1991-96 investment should grow on average by over 5.5%. Investment in the agricultural sector is likely to fall over the period due to the poor prospects for farmers' incomes. The prospects for investment in the food-processing sector are also poor as the sector undergoes rationalisation. The

growth in building investment will be slightly below 5.5% due to the composition of the investment over the period.

Exports

In the short term, in 1992, our forecast for agricultural exports is affected by our assumption that intervention stocks remain unchanged after 1991. This means that there is a shift in agricultural produce from building up intervention stocks, as in 1990 and 1991, to direct exports. The result is a volume increase in 1992 of 13% (Figure 4.15). Thereafter, the volume of agricultural exports is constrained by the absence of growth in agricultural output. The small rise each year from 1993 onwards of on average 1% arises from some increase in the value added of the food-processing sector.

Figure 4.15
Exports

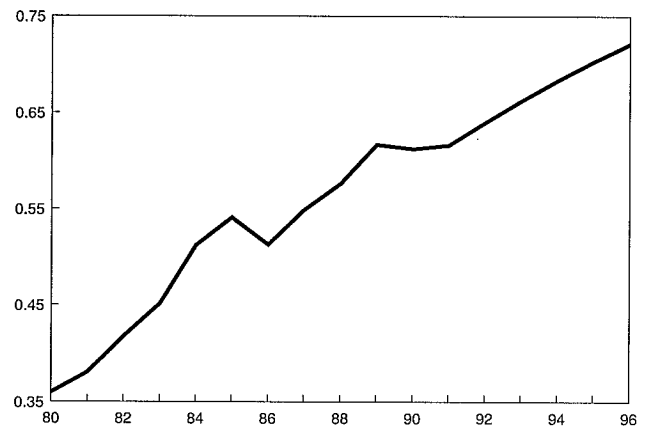


If at some stage in the future intervention stocks were completely liquidated this would provide a temporary additional increase in the volume of exports. However, the value of these exports could be quite low, much of the value of the original purchases having already been paid in the form of EC subsidies.

As with agricultural exports, industrial exports are ultimately determined by the supply capacity of the Irish industrial sector. As discussed earlier, that capacity is, in turn, dependent on the variables which appear in standard export demand functions, world demand and relative competitiveness. Figure 4.16 shows that the ratio of the value of industrial exports to the value of output of the manufacturing sector has risen steadily over the last ten years. At present they account for 62% of manufacturing output. While this ratio has risen rapidly in the past, the scope for a further increase in the proportion of output exported beyond 1996 is limited.

Thus we can expect the volume increase in industrial exports to slow over the next five years. However, as shown in Figure 4.15, at 7.3% a year the volume growth will remain rapid, even if it is below that experienced in the late 1980s. The result will be a further increase in the share of output exported. This makes the Irish industrial sector unusually independent of domestic demand and open to developments on world markets.

Figure 4.16
Ratio of Industrial Exports to Output



Tourism exports have shown extremely rapid growth in recent years. Any estimate for the period 1986-91 based on previous trends seriously underestimates the actual out-turn. Even allowing for some slow-down in 1991 the average volume increase since 1987 is over 8% a year. This represents a major increase in market share. It is still unclear to what extent this change has been driven by changes in competitiveness, changes in marketing, or changes in tastes, especially on the European market. As a result, there is some uncertainty as to whether such a rate of growth can be sustained over the next five years.

While the effects of the Gulf war and the recession in the US and the UK will affect growth this year and, to a lesser extent, next year, it can be expected that growth will continue in the next five years. However, in the light of the somewhat less buoyant forecast for the UK and the USA in the medium term, we have assumed that growth averages around 4.2% a year.

The forecast for other services exports, including transportation, is for an average growth of 2.3% a year, somewhat slower than in the last few years. This reflects the somewhat less buoyant forecast for tourism and merchandise exports, both of which affect the demand for exports of other services.

Imports

In forecasting imports in the medium term we first forecast what will be the growth in domestic supply, taking account of the competitiveness of the economy. We then consider the likely level of final demand, including export demand. Imports are then determined as the difference between domestic demand and domestic supply.

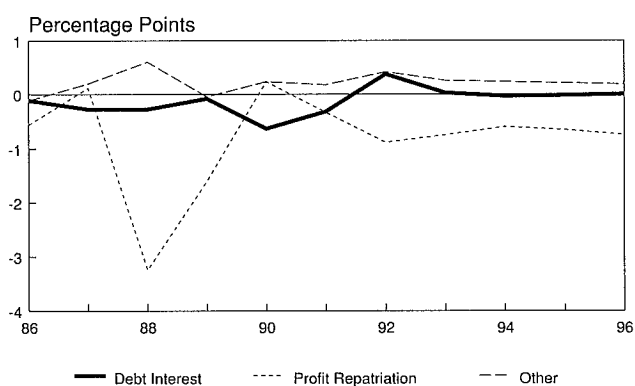
As shown in Table 4.5, we expect the volume of imports to grow more rapidly in 1992 and 1993 than it has in the last two years. This pick up reflects the recovery in the economy. In particular the rapid growth in investment, which tends to have quite a high import content, fuels the growth. However, as the special factors affecting investment fade out after 1993 and as domestic output growth continues, there is some reduction in the rate of growth of imports. None the less,

they still grow substantially more rapidly than does the volume of GNP, increasing the openness of the Irish economy.

Net Factor Income

In the period 1980-90 the average rate of growth in GDP was around 3% while the average growth in GNP was 2%. Driving a wedge between these two aggregates was the extremely rapid growth in what is called net factor income. (This item is, in fact, negative representing a net outflow). This rapid growth in net factor income was attributable to two of the three elements in net factor income: national debt interest and profit repatriations (Figure 4.17).

Figure 4.17
Net Factor Income
Contribution to Growth in GNP



Over the 1980s the growth in national debt interest was a natural corollary of the rising debt. The growth in profit repatriations reflected the extent to which the very successful and profitable high technology sector was foreign owned. However, over the next five years foreign debt, while still rising in absolute terms, will fall as a percentage of GNP, leading to only a small increase in debt interest payments. In the case of profit repatriations their growth over the period to 1996 will be more rapid than the growth in the value of GDP, exerting some negative effect on the value of GNP. However, the residual *other factor income* item, which is an inflow, will rise over the period to 1996 due to the build up in private foreign assets consequent on the balance of payments surplus. Together these changes will leave the overall growth in net factor income slightly below that for GDP. As a result GNP will grow slightly faster than GDP.

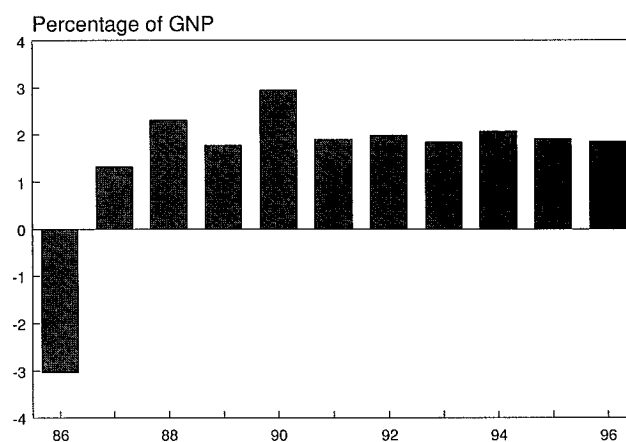
GNP

Over the next five years GNP should grow at around 3.7% a year. As explained above the expected growth in GDP is just over 3.5% a year. The recovery next year will see the growth rate rising to approximately 3.75%. In 1993 it may reach a temporary peak, partly due to special factors driving investment. Thereafter the growth rate should settle down to around 3.5% a year.

4.6 THE BALANCE OF PAYMENTS

One of the most striking manifestations of the turn-around in the Irish economy in the 1980s was the change in the balance of payments. In 1981 the deficit on the balance of payments was nearly 15% of GNP. By 1990 it had been turned into a surplus of nearly 3% a year (Figure 4.18). A major factor in this reversal was the very deflationary fiscal policy followed throughout much of the 1980s (see chapter 2). This had the effect of deflating domestic demand and, therefore, the demand for imports. From 1986 onwards, as discussed earlier, the improvement in Ireland's competitiveness led to a rapid growth in industrial output and exports. While international transfers, predominantly from the EC, grew over the decade, their contribution to the recovery was small.

Figure 4.18
Balance of Payments Surplus



Ireland has entered the 1990s with a significant balance of payments surplus. We envisage a continuation of this surplus at around 2% a year into the medium term. As discussed earlier, net factor income paid abroad, while continuing to grow, will rise much more slowly than in the 1980s. In spite of adverse movements in the terms of trade the competitiveness of the economy should see a continuing growth in the balance of trade. However, net international transfers from the EC will show little or no change from their present high level. No allowance has been made for a possible increase in transfers from the EC as compensation for the problems posed by tax harmonisation or from an increase in the size of the CSF after 1993.

In the longer term some of the factors which could result in a return to the chronic balance of payments deficits experienced by Ireland prior to the mid 1980s would be: a fall in domestic supply due to a major loss of competitiveness; a permanent fall in the personal savings ratio to historically unprecedented levels; a return to an era of fiscal extravagance. Any increase in the rate of private sector investment above the forecast level due to enhanced prospects for profitability, while putting temporary pressure on the balance of payments, would increase capacity and actually increase the surplus in the long term.

TABLE 4.6: Employment and the Labour Force, mid April (thousands)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Agriculture	164	166	163	165	162	157	152	147	142	138
Industry	300	300	306	322	325	334	343	346	350	354
Traditional Manufacturing	107	107	109	112	115	116	118	119	121	123
Food Processing	37	37	36	38	37	36	35	34	33	32
High Technology	71	73	76	82	85	88	93	97	100	102
Manufacturing	215	216	222	232	237	241	246	250	254	257
Utilities	14	14	14	13	13	13	13	13	13	13
Building	71	70	70	77	75	81	84	82	83	84
Market Services	410	424	427	441	443	450	460	467	474	481
Distribution	166	172	171	173	174	177	179	180	182	183
Transport & Communica- tions	66	64	66	67	65	64	64	64	63	63
Professional & Financial	178	188	191	201	204	209	217	223	229	234
Non-Market Services	206	201	194	192	193	195	197	199	201	203
Health & Education	136	131	128	128	129	130	131	133	134	135
Public Administration	70	70	66	64	64	65	65	66	67	67
Total	1080	1091	1090	1120	1123	1136	1151	1158	1167	1174
Unemployment	232	218	203	183	212	215	215	220	223	224
Labour Force	1312	1309	1293	1303	1335	1351	1366	1379	1389	1398
% of Labour Force										
Unemployment Rate	17.7	16.7	15.7	14.0	15.8	15.9	15.7	16.0	16.0	16.0
Labour Force Participation Rate	61.2	60.9	60.4	60.6	61.7	61.9	62.1	62.3	62.4	62.6
Net Emigration	27	32	46	31	5	9	12	17	23	28

Provided a prudent fiscal policy is followed in the 1990s this continuing surplus will underpin Ireland's recovery and will make possible continuing progress towards EMU. It will allow either the repayment of some of the government's debts or, alternatively, a build up in private sector foreign assets. Finally, it will keep downward pressure on domestic interest rates in the run up to the third stage of EMU.

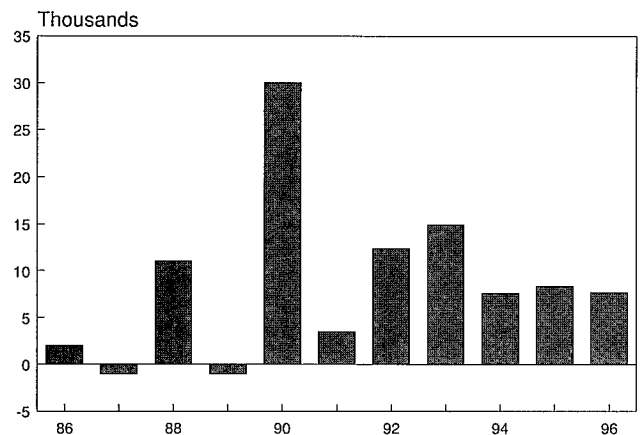
4.7 LABOUR MARKET

The trend of employment in each sector of the economy has been discussed earlier and is summarised in Table 4.6. While quite satisfactory compared to the 1980s, when employment fell significantly, the forecast rise of 0.9% a year for total employment over the next five years is still quite moderate (Figure 4.19). It is marginally slower than the average growth in employment experienced in the recovery years 1987-91. The contrast with the 1980s is greater at the sectoral level; whereas employment in industry fell by almost 50,000 between 1980 and 1990 it should rise by almost 30,000 over the next five years. However, it will still be below its 1980 level in 1996. By contrast the market services sector saw an increase in employment in the 1980s. This increase should continue for the next five years.

As discussed in chapter 3, the net increase in the labour force (new entrants less retirals) will average between 20,000 and 25,000 a year over the rest of this decade. This increase is much greater than the forecast increase in employment. The result will be either an increase in unemployment or emigration.

The recession currently underway in the UK has serious implications for the development of the Irish labour force. As shown in Figure 4.20, emigration picked up in the mid-1980s with the improvement in the UK labour market. However, with unemployment rising rapidly in the UK from the end of 1990 the UK labour

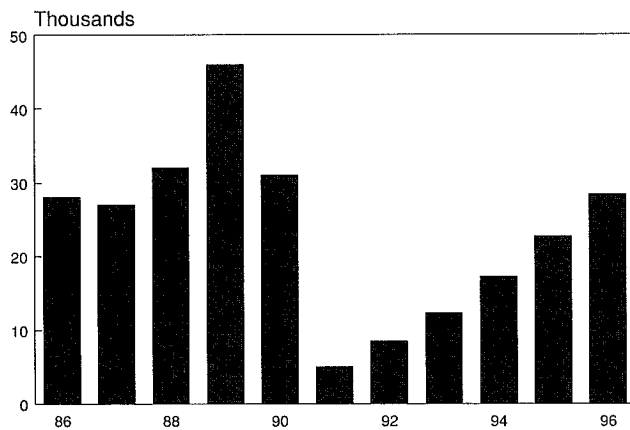
Figure 4.19
Change in Total Employment



market has turned sour for Irish emigrants. While the UK economy may turn the corner at the end of this year we envisage a continuing rise in UK unemployment into 1992. It will be 1993 or 1994 before it begins to fall and even by 1996 unemployment in the UK should be well above the levels experienced between 1988-90.

The labour markets in other possible destinations for Irish emigrants are also unfavourable. The US and Australia are also in recession. In Germany the rate of unemployment in the old GDR is rising well above Irish levels and this provides a large pool of potential German speaking labour for industry in the West. In the medium-term it is difficult to predict how attractive the broader European labour market will prove for potential Irish emigrants. Past experience suggests that it will not prove a major draw, other than for those with high levels of skill and education.

Figure 4.20
Numbers Emigrating



As a result, we believe emigration in the year to April 1991 will fall to a very low level, around 5,000. It should remain under 10,000 in 1992. Thereafter, as the UK labour market improves, it will increase but even in 1996 it will still be below the 1990 level.

The effect of this reduction in emigration is to put much greater pressure on the domestic labour market. As shown in Figure 4.21, the numbers unemployed, having risen by nearly 30,000 in the year to April 1991, will show further small increases each year until 1996. By 1996 the numbers unemployed should peak at around 16% of the labour force. While below the recession years of the mid-1980s, this is a very high level by historical standards. It must be viewed in the context of the rapid growth in the labour force and the unfavourable labour market conditions outside Ireland.

Figure 4.21
Unemployment Rate



There remain many areas of uncertainty concerning future developments in the labour force. Forecasting emigration is extremely difficult. Obviously if the UK or broader EC labour market showed a more rapid recovery than we have forecast, emigration could increase quite quickly. This, in turn, could lead to a fairly rapid turn-around in unemployment in Ireland.

On the other hand, the assumptions concerning labour force participation, shown in Table 4.6, are quite conservative. If participation by married women in the labour force were to rise more rapidly than assumed it would increase the labour force. Finally, we have assumed a constant educational participation rate (proportion of the population in education) over the forecast period. This rate rose significantly in the 1980s. With a very high proportion of children now completing second level education, it is not clear how much further this rate can rise. However, the extension of second level education to a six year cycle could lead to some increase. Such a further rise would reduce the labour force in the forecast period.

4.8 THE PUBLIC FINANCES

As discussed in the introduction to this *Review*, our last publication in 1989 forecast reasonably accurately the growth in GNP over the period 1989-90. Even with the lower than forecast growth in 1991 one might have expected our 1989 forecast for the public finances to have proved reasonably accurate. However, instead of an exchequer surplus in 1991 of over 1% of GNP, as forecast in 1989, we are facing a borrowing requirement of a minimum of 2% of GNP, probably higher (Table 4.7). In our forecast we have assumed that receipts from privatisation make up for the shortfall on the current side of the budget this year. This failure to move into surplus has been due to two factors: a relaxation of fiscal policy and the deterioration in the external environment.

Fiscal policy was more lax over the period 1990-91 than we had forecast. Both the 1990 and 1991 budgets made substantial cuts in taxation which were not funded by adequate cuts in expenditure. The problem with the 1991 borrowing requirement is not so much the likelihood of an excess over budget, but the fact that the initial opening position was much too high.

The situation has also been aggravated by external factors: interest rates and public service pay. Prospects for interest rates both at home and abroad have disimproved significantly, largely because of the effects of German unification. We have already discussed the problems posed for the economy as a whole by the very rapid growth in public service pay. However, it has its most direct effect through the public finances.

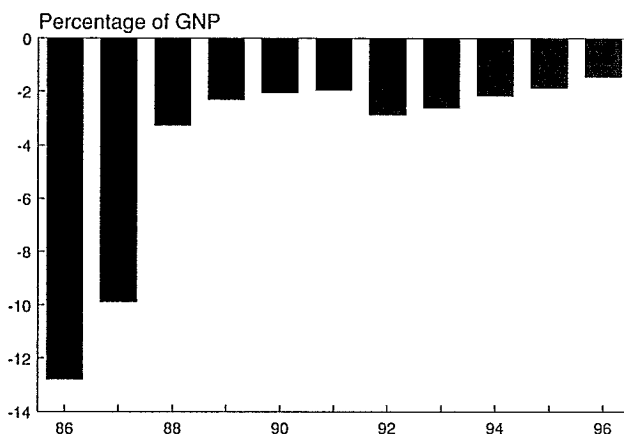
The net effect of this disimprovement in the public finances is to make the problems of tax harmonisation and control of the debt in the medium-term more difficult. Whereas we previously had anticipated no serious problem in reducing the debt/GNP ratio in the medium-term, it is now clear that this imperative will require greater effort and attention in the future.

TABLE 4.7: The Public Finances, percentage changes

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Taxes on Income and Wealth	12.8	-3.4	10.8	6.4	5.7	5.3	6.1	5.2	6.0
Company	29.3	0.3	55.7	10.0	3.5	7.2	8.7	4.3	5.9
Personal	11.6	-3.7	7.0	5.9	6.0	5.0	5.8	5.4	6.0
Taxes on Expenditure	9.8	10.3	2.5	2.9	3.9	5.6	5.6	6.1	6.4
Net Trading & Investment Income	-2.3	-21.7	18.5	12.4	-8.2	3.3	2.3	2.5	2.8
Transfers From Abroad	-23.7	-0.6	-10.6	123.6	-11.1	6.3	2.9	2.9	2.8
Total Current Receipts	9.7	1.2	7.0	7.1	3.8	5.4	5.6	5.4	6.0
Subsidies	18.8	-58.2	44.7	-21.8	33.8	3.2	2.5	3.0	3.4
National Debt Interest	3.6	0.9	6.7	2.4	-1.5	3.1	3.4	3.4	3.5
Other Transfer Payments	3.8	0.1	4.2	7.9	3.9	3.8	4.0	3.9	3.8
Public Consumption	0.5	2.4	8.9	9.6	7.8	7.9	5.7	5.8	6.3
Total Current Expenditure	3.7	-4.2	8.1	5.8	5.5	5.3	4.5	4.6	4.8
Budget Deficit as % of GNP	1.7	1.3	0.7	1.2	2.0	2.0	1.6	1.2	0.8
Total Capital Receipts	37.3	-25.0	13.7	61.3	-12.8	14.3	2.3	2.5	2.8
Total Capital Expenditure	-19.6	-28.6	19.1	28.8	-5.8	5.9	2.6	3.4	3.6
Exchequer Borrowing as % of GNP	3.3	2.3	2.0	1.9	2.9	2.6	2.2	1.9	1.4

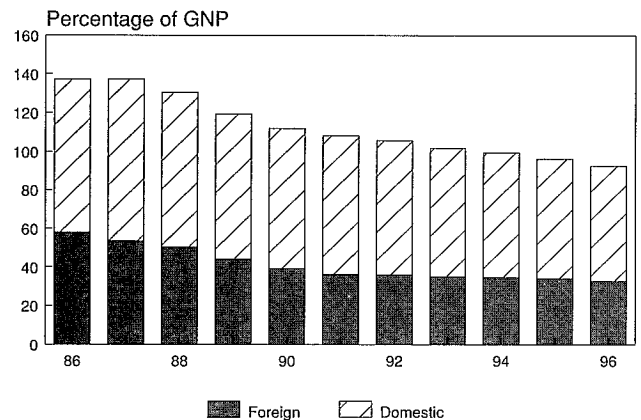
Even with a recovery in economic growth in 1992 and 1993 the moves to harmonise taxes will add to the borrowing requirement. Unless action is taken to increase taxes or cut expenditure to fund the necessary changes the borrowing requirement will rise towards 3% of GNP (Figure 4.22). From 1994 onwards we have assumed that there are limited tax cuts and a small improvement in public services. On this basis the borrowing requirement would start falling again. However, it would only fall below the 1991 level by 1996.

Figure 4.22
Exchequer Surplus



The debt/GNP ratio underwent a rapid fall from its peak year, 1987 to 1990 (Figure 4.23). While we forecast a continuing improvement in the ratio each year for the next five, the progress is likely to be slower than we had previously anticipated. It will leave the debt/GNP ratio still above 90% in 1996. The reduction in the ratio will be shared fairly equally between the ratio of domestic and foreign debt to GNP. Even in 1996 the debt/GNP ratio in Ireland will still be quite high by EC standards.

Figure 4.23
Debt GNP Ratio



The upward revision in the forecast for real interest rates in the medium term increases the potential rewards from debt reduction while making its achievement more difficult. Investments, which might otherwise have been potentially profitable, have now been rendered unattractive. The trade-off between debt reduction and investment has been altered in favour of more rapid debt reduction.

While the debt/GNP ratio remains above 100% we remain very vulnerable to outside shocks such as a major reform of the CAP. As can be seen this year, any reduction in growth below the trend rate has serious effects on the public finances. Thus if the recovery from recession in the UK and the USA were postponed it would have serious consequences for the public finances next year. In addition, because of the uncertainty surrounding the German economy, there remains a danger that real interest rates could rise above our forecast level. If this were to occur it would simultaneously reduce growth in the EC and Ireland and would increase the burden of the debt interest payments.

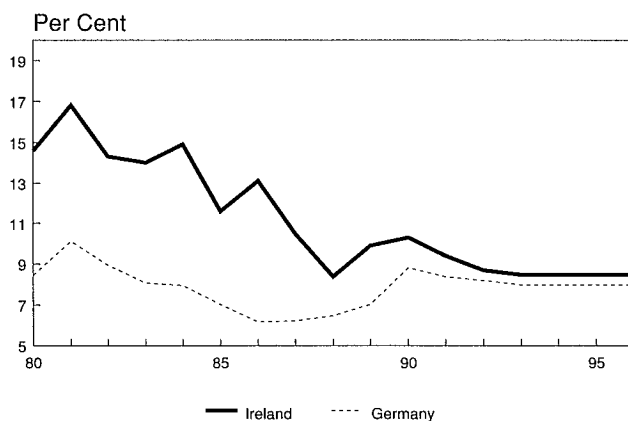
4.9 THE MONETARY SECTOR

As discussed in chapter 3, the outlook for interest rates in the medium-term depends on progress towards EMU. In this *Review* we have assumed that the final stage of EMU is not reached before the end of the decade. Even if there is rapid progress and the Irish pound is fixed to the DM before that date, previous experience with the sterling regime indicates that interest rates in Ireland will remain above DM rates while there are separate currencies. The lower liquidity of Irish government debt will make it less attractive than debt issued by Germany. Thus there is a lower bound on the gap between Irish and German interest rates of between 0.25% and 0.5%. However, as we have experienced in the recent past, it is quite possible for that margin to be substantially larger.

The fact that the margin has fallen to its current level of around 1% for long-term rates is due to a number of different factors. The uncertainties concerning the German economy have weakened the position of the DM, both within the EMS and *vis-à-vis* the dollar and the yen. Thus there is little pressure for a DM appreciation within the EMS. In addition, the relatively strong balance of payments position of the Irish economy gives cause for confidence in the sustainability of the Irish pound's present position within the EMS. This latter factor has been important in the last two years.

Over the forecast period, as shown in Figure 4.24, the gap between Irish and German interest rates should narrow to a half a percentage point. The convergence of short-term rates may take somewhat longer.

Figure 4.24
Long-Term Interest Rates



The ending of exchange control has led to a major private capital outflow in the last two years as the private sector adjusts its portfolio of assets. Its holdings of foreign assets at the end of 1988 were considered much too low by the relevant financial institutions. The gradual abolition of all forms of exchange control in 1992 and 1993 could generate additional outflows.

The fact that the current account of the balance of payments has been in substantial surplus in recent years has facilitated this adjustment of portfolios. In addition, the balance of payments surplus has been a sign of the strength of the Irish economy and has encouraged foreign investors to increase their holdings of Irish financial assets, especially of Irish government debt.

This has allowed domestic holders of government debt to sell their Irish government securities and reinvest their funds abroad without taking a substantial capital loss. Without these two flows of funds into the country, through the current and capital accounts of the balance of payments, the portfolio adjustment by the Irish private sector might have led to even higher domestic interest rates than actually occurred.

As it was, the need to attract a substantial inflow of foreign funds, to buy Irish government securities from the domestic institutions wishing to adjust their portfolios, led to higher interest rates than might otherwise have been the case in 1989 and 1990. While Irish institutions were reasonably happy about the position of the Irish pound in the EMS, foreign institutions had to devote resources to familiarising themselves with the Irish economy before they could be happy investing. To pay for this acquisition of information they required a substantial interest differential compared to similar DM and even French franc assets.

A further problem with the growth in foreign holdings of Irish government securities is that it could pose difficulties in the future for the Central Bank in managing the exchange rate. Because such securities are potentially saleable without notice on the Irish stock exchange they can theoretically be converted without warning into a foreign exchange liability for the Central Bank. In practice such a liability can be avoided or delayed by allowing interest rates to rise sufficiently to deter sales. However, this adds an additional source of instability to interest rates. If the borrowing from abroad had been undertaken by the government in foreign currencies in the normal way, the Central Bank would know with certainty when the foreign exchange liability would mature.

The portfolio adjustment by the Irish private sector took place rapidly over the last two years. In the future the capital outflow is likely to be somewhat smaller as the institutions' main concern is the maintenance of balance in the portfolio of new investments. In addition, foreign institutions have become more familiar with the Irish economy and see Irish pound assets as less risky investments than they did in the past. Thus the interest differential on medium and long dated government securities between Ireland and Germany (or France) has narrowed. Downward pressure on this margin should be maintained by the Irish government borrowing, where necessary, in foreign currencies, rather than letting Irish pound rates rise to attract in foreign funds indirectly.

Table 4.8 shows the forecast for the flow of funds over the next five years. The company sector, which actually had a surplus of funds over investment needs in 1987 and 1988, has an increasing need to borrow funds in the next five years. This reflects the rapid increase in the investment likely to be undertaken by the sector rather than a down-turn in profitability. However, by 1996 the size of the financing requirement of this sector, in the absence of increased profitability, may put some restriction on the volume of investment undertaken.

TABLE 4.8: The Flow of Funds, £ million

	1988	1989	1990	1991	1992	1993	1994	1995	1996
Company Sector									
Sources of Funds	2327	2248	2730	2909	2917	3107	3214	3384	3569
Acquisition of Real Assets	1917	2293	3029	3220	3310	3622	3819	4149	4506
Acquisition of Financial Assets	410	-44	-299	-312	-394	-515	-605	-765	-937
Net Acquisitions Ratio	17.6	-2.0	-11.0	-10.7	-13.5	-16.6	-18.8	-22.6	-26.2
Household Sector									
Sources of Funds	2567	2606	2799	2906	3270	3455	3576	3720	3879
Acquisition of Real Assets	1155	1611	1623	1531	1610	1760	1854	1971	2100
Acquisition of Financial Assets	1412	994	1176	1376	1661	1695	1722	1749	1779
Net Acquisitions Ratio	55.0	38.2	42.0	47.3	50.8	49.1	48.2	47.0	45.9
Company + Households									
Sources of Funds	4893	4854	5529	5815	6187	6562	6790	7104	7448
Acquisition of Real Assets	3071	3904	4652	4751	4920	5382	5673	6120	6606
Acquisition of Financial Assets	1822	950	877	1064	1267	1180	1117	984	842
Net Acquisitions Ratio	37.2	19.6	15.9	18.3	20.5	18.0	16.5	13.9	11.3
% Net Acquisitions Lent to Government	-12.4	-3.7	9.5	6.3	9.6	9.2	8.0	7.3	6.6

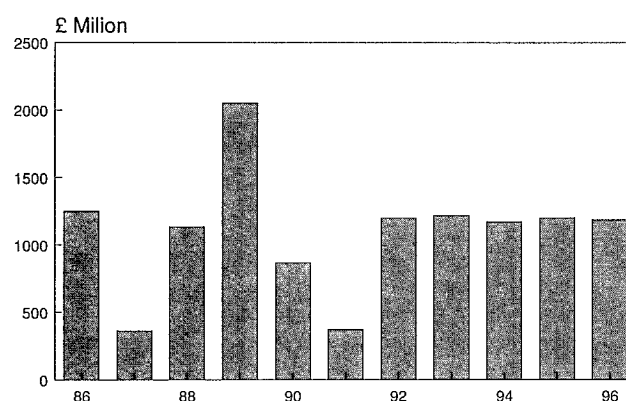
For the personal sector the assumption of a fairly constant savings ratio means that funds available for investment will rise steadily over the period. However, the two major areas for personal investment are agriculture and housing. In the case of the former the adverse prospects for agricultural incomes will lead to an actual fall in investment. While there will be significant growth in the volume of private housing investment it will be financed easily from the growth in savings. This will leave a growing residual for investment in financial assets. While lower than in the recession years of the 1980s, the proportion invested in financial assets will be quite high compared to experience in earlier periods of economic growth.

Taken together the company and household sectors will have a surplus of funds available over and above their needs for financing physical investment. We have assumed that around 17% of new investment in financial assets by the household sector goes on government securities. The rest of the surplus funds are then assumed to be invested abroad.

In the absence of a proper model of the portfolio behaviour of the private sector it is difficult to forecast trends in the capital account of the balance of payments. As indicated above there is some reason to believe that the recent large outflows may be part of a once off adjustment. However, the forecast for private investment abroad, derived residually as explained above, remains large over the next five years (Figure 4.25). While movement towards EMU may make rising shares of foreign assets in investment portfolios increasingly acceptable to conservative financial institutions, the extent of the investment implied by these figures is quite large.

One possibility is that a higher share of new investment by the private sector might go into government securities. This would reduce government foreign borrowing and private foreign investment by the same amount. The reduction in debt interest payments abroad would be offset by a reduction in earnings on private sector foreign assets. Thus changes in the allocation of funds compared to our central forecast would not directly affect the macro-economic forecast. It is only if such changes affected domestic interest rates that

Figure 4.25
Private Capital Outflow
(Non-Bank)



there would be a real effect. However, with movement towards EMU the scope for changing domestic interest rates will be quite limited.

The growing financing needs of the company sector will not be met from internal funds. This funding need, together with the absence of other domestic opportunities for investment by the personal sector (including the financial institutions), will provide new opportunities for financial intermediaries.

The banking system over the 1980s has been hit by a number of unfavourable shocks. The dominance of the government sector in the market for funds reduced their role as a financial intermediary. In addition, the banks' position in the market for funds was adversely affected by the imposition of the DIRT tax.

Over the next five years the diminished importance of the government sector in the market for funds will increase the role of the banking system. It is at present better placed to channel surplus funds from the personal sector to the company sector than are insurance companies or pension funds. The financing needs of the company sector will also be greater than in the 1980s due to the higher rate of growth and investment.

Finally, the abolition of all forms of exchange control and the completion of the EC single market at the end of 1992 will expose the banking sector in particular to greater competition. For larger firms there will be increasing possibilities of cutting financing costs by looking to the wider EC banking system. However, given the relatively small size of most Irish firms they will generally still be dependent on the domestic banking system. If they are to prosper it will be important that the efficiency gains in the wider EC banking system are passed on to Irish firms through increased competition at home.

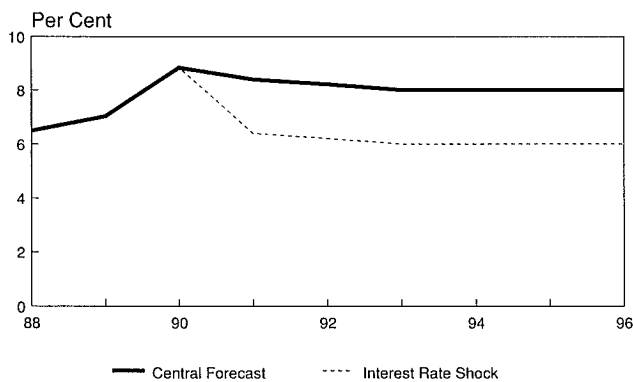
4.10 UNCERTAINTIES

As with all previous *Medium-Term Reviews*, forecasting is made difficult by the fact that there are many areas of uncertainty in the external environment facing the Irish economy. Today there are two major external factors which give rise to uncertainty: the effects of German unification on interest rates; the timing and magnitude of the recovery in the US and UK economies. In this Section we explore how our central forecast would be altered by changes in the assumptions which we have made about interest rates and recovery in the UK and the US.

Higher Interest Rates

In the first simulation we examine how the Irish economy has been affected by the rise in German interest rates over the last two years. This gives a good idea of the effects of one aspect of German unification on the medium-term prospects for the Irish economy. It also shows how the Irish economy would be affected by any further changes in real interest rates, over and above those allowed for in our central forecast. As shown in Figure 4.26, in the simulation, beginning in 1992, we reduced German (and Irish) interest rates by two percentage points below what they would otherwise have been. This change was made for the rest of the decade.

Figure 4.26
Interest Rate Shock
German Long-Term Interest Rate

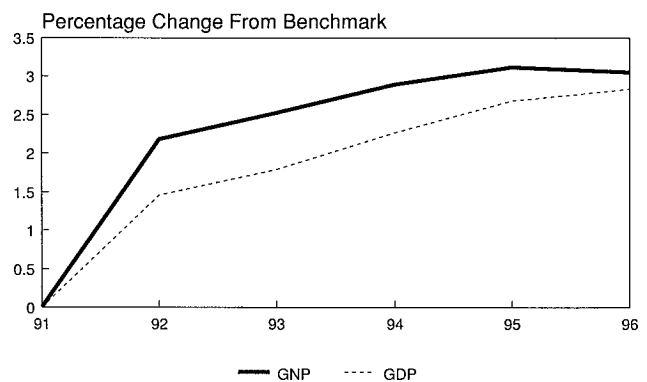


This interest rate reduction affects the Irish economy through two main channels. Given the size of the national debt it has major implications for the exchequer's finances. Secondly, it affects private sector behaviour, especially the volume of investment and, in the medium term, productive capacity. In the simulation

we have assumed that any effects on the exchequer finances are sterilised in the medium term by a cut in income taxes. The improvement in the borrowing requirement would be enough to finance a 20% reduction in all income tax bills over the period to 1996.

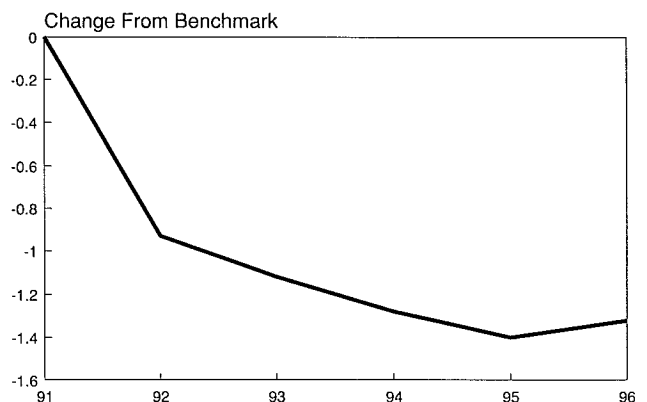
The effects of this combined reduction in interest rates and the rise in income tax on GDP and GNP is shown in Figure 4.27. The initial effects on GDP are smaller than on GNP because it takes time for output capacity to rise. However, by 1996 GDP would be 2.8% higher and GNP would be 3.1% above the central forecast level. The favourable effect on the government's finances occurs much more rapidly.

Figure 4.27
Interest Rate Shock
GNP and GDP



The interest rate cut affects employment through three channels: it reduces the cost of capital and, therefore, the cost of production, leading to an increase in output; the cut in taxation increases domestic demand for goods and services; the reduction in tax rates leads to a reduction in wage rates, increasing Ireland's competitiveness. By 1996, as a result of the lower interest rates, almost 30,000 more people would be employed than under the central forecast. As shown in Figure 4.28, the reduction in the unemployment rate would initially be 0.9 percentage points, peaking at 1.4 percentage points in 1995.

Figure 4.28
Interest Rate Shock
Unemployment Rate, percentage points



Our model takes no account of the possible wealth effects on consumers arising from lower interest rates. These have proved to be important in other countries. If they were taken into account it would increase the estimated effects on GNP of the interest rate shock above those shown here.

The results of this simulation indicates that the Irish economy is highly sensitive to any rise in EC interest rates. The rise which has already occurred as a result of German unification has reduced the growth rate of the Irish economy in the medium-term by over 0.5% a year. While some of this effect is offset by the more rapid growth in German demand, the effects of German unification, taken together, are clearly negative for Ireland in the medium-term. Most of the downward revision in our estimate of the medium-term growth potential of the economy since our last *Review* can be attributed to this change in the external environment.

This simulation also highlights the dangers to the Irish economy of any further disturbance pushing interest rates above the level in our central forecast. Our high level of indebtedness leaves us very vulnerable to shocks to the international financial system. Because of our indebtedness the most important channel through which changes in interest rates affect the economy is through the government sector. Any further rise would necessitate urgent action to deal with the problem caused for the public finances.

Postponed World Recovery

Considerable doubt remains about the timing of the recovery in the UK and US economies. While we still expect a slow recovery next year, in this Section we explore the possible effects on the Irish economy of a postponement of the recovery. We assume that the growth of output in 1992 in both the US and the UK is approximately 2 percentage points below the level assumed in our central forecast. Compared to 1991 this would involve a small fall in output in the UK and no change in the US. From 1993 onwards these two economies are assumed to grow at the same rate as in the central forecast. (They do not recover the output lost in 1992.)

Slower growth in the UK would adversely affect unemployment in that country. We assume that the UK unemployment rate in 1992 is 1 percentage point above the level in the central forecast in 1992 (over three million unemployed). From 1993 onwards we assume that it is 1.5 percentage points above the (declining) level in the central forecast.

The effect of the prolonged recession would be to reduce the Irish growth rate by 0.5% in 1992 (Figure 4.29). There would be some small additional effects in subsequent years. The initial effect on employment would be a loss of over 4,000 jobs (Figure 4.30). By 1996 employment would be only 2,300 below the benchmark level as the effects of the recession on demand wore off.

Figure 4.29
Recession Shock
GNP

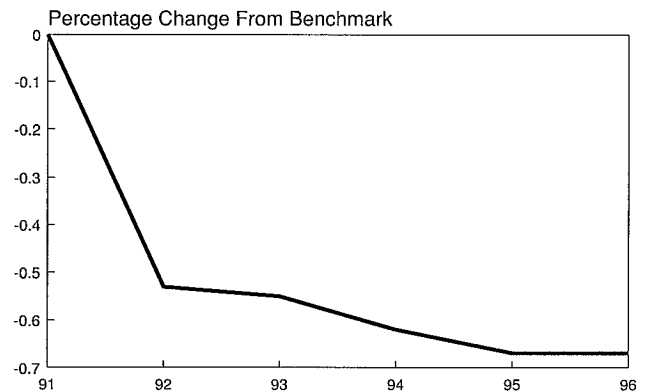
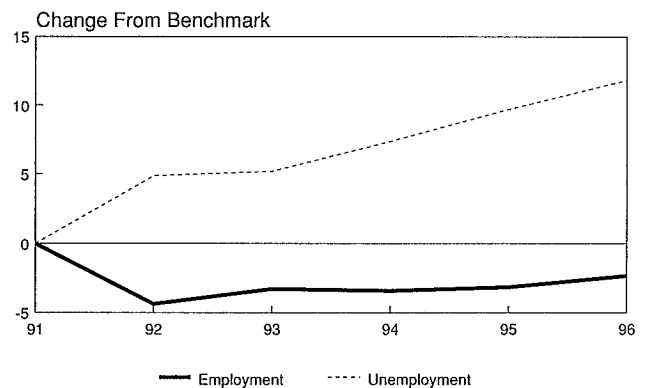


Figure 4.30
Recession Shock
Employment & Unemployment, Thousands



However, the effects on unemployment would be rather different. In 1992 the numbers unemployed would be up by almost 5,000 on the central forecast. As the state of the UK labour market continued to discourage emigration in the years after 1992, the labour force in Ireland would build up. By 1996, unemployment would be almost 12,000 above the central forecast level.

This simulation highlights the importance of the UK labour market to the development of the Irish labour market. The effects of a deterioration in the UK economy on Irish unemployment comes through two channels: it reduces the demand for Irish goods and, therefore, employment in Irish firms; it reduces the level of emigration over a number of years. The second of these (the emigration effect) is now more important in the medium term for unemployment than is the direct, demand, effect.

4.11 CONCLUSIONS

The recovery in the Irish economy in the late 1980s was due to a number of different factors. First, as shown in chapter 2, the world economy underwent a period of very rapid growth which passed through to the Irish

economy. Second, as discussed above, the competitive position of the Irish economy improved over the second half of the 1980s.

In the next five years Ireland faces a less attractive world environment than in the last five. However, the deterioration should not be exaggerated. As shown above, doubts about the precise timing of the recovery in the UK and US economies will not greatly alter our view about the medium-term prospects for Ireland. Ireland will face a continuing growth in world demand and a continuing flow of foreign investment. The high level of real interest rates has undoubtedly reduced the potential growth rate of the Irish economy by around 0.5%. However, we have built this into our central forecast.

As discussed earlier, the competitiveness gains made in the late 1980s have been preserved. We have seen some of the benefits from this improvement in the growth in employment in 1990. In our central forecast we forecast that these gains will be eroded only slowly throughout the next five years so that the Irish economy should continue to perform somewhat better than the average for the EC.

Taken together, these different factors mean that, even allowing for the slow-down this year, the Irish economy has the potential to grow at around 3.5% a year in the next five years. As shown in Figure 4.31 this is broadly in line with the experience in the 1986-90 period, though slightly lower than the rate of growth experienced in the 1960s and 1970s

Figure 4.31

Average Growth Rate
GNP, Expenditure Basis

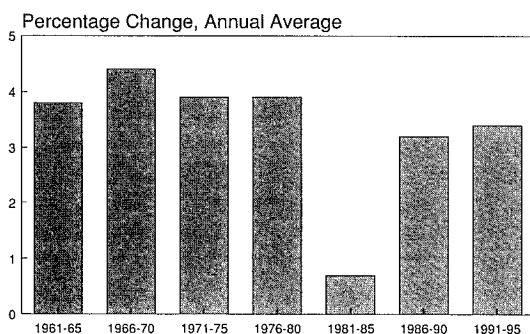


Table 4.9 shows the forecast average contribution to growth from key sectors of the economy over the next five years. For comparison, figures are also shown for the 1980s. This table shows that, net of profit repatriations, the manufacturing sector contributed 1.8 percentage points to growth in the second half of the 1980s. In the 1991-95 period it will contribute 1 percentage point. This reduction reflects the somewhat less favourable world environment.

The contribution from agriculture has fallen steadily over time and is likely to be negligible in the next five years. The turn-around in the foreign debt interest payments was a major factor in the recovery in the

economy. Whereas in the 1981-5 period it knocked over 0.5% off the growth rate each year, in the 1991-95 period it will have no deleterious effect on growth.

**TABLE 4.9: Contribution to Growth
percentage points, annual average**

	1981-85	1986-90	1991-95
Manufacturing	-	1.8	1.0
Building	-0.3	-	0.1
Agriculture	0.4	0.2	-
Market Services	0.6	1.3	1.4
Non-Market Services	0.3	-0.1	0.1
Foreign Debt Interest	-0.6	-0.3	-
Other	-0.7	0.6	0.7

The single biggest contributor to growth in the medium-term will be the market services sector. While this sector is affected by the growth in tourism exports, its output must be seen as being largely induced by the growth in other sectors in the economy.

In Section 10 we considered two areas of uncertainty about the future - interest rates and the nature of the recovery in the UK and the USA. There are many other factors which could also throw our central projection off course. For example, developments on the UK labour market have major implications for the level of Irish unemployment. A more rapid recovery in that labour market could see a fall in Irish unemployment rather than the forecast rise.

Unless a fairly tough stance is adopted on fiscal policy in the next few years, the problem of the debt could return to dominate the national agenda. Related to this is the problem of pay determination generally in the economy. We have seen how moderation in private sector pay in the last few years has paid off in terms of employment growth in 1990 and this year in the insulation of the existing levels of employment from the recession in the UK. If the current pattern of moderation in the private sector were to break down, in particular because of the rapid rise in public service pay, it would be very serious for employment growth in the future. This issue is taken up in the next chapter.

In summary, while there is likely to be a reasonable growth in GNP in the next five years, it will be somewhat slower than in the 1960s and 1970s. However, the prospects for unemployment are not satisfactory. Faced with the unfavourable state of the UK labour market it is important to consider what domestic action can be taken to deal with the problem.

Past experience shows that fiscal expansions can not promote lasting growth in employment. The most that can be hoped is that fiscal policy will be directed to a sustained reduction in the debt leaving the economy less vulnerable to shocks, such as that of German unification. For the future, policy changes must be directed to improving the efficiency of the supply side of the economy so that the industrial sector can compete effectively in European markets. The need for such action underlies the logic of the EC Community Support Framework (CSF). In the next chapter we consider what domestic action can be taken on the supply side to raise the long-term growth potential of the economy.

IRELAND IN THE YEAR 2000

5.1 INTRODUCTION

The central forecast in the previous section takes us from the time horizon of the latest *Quarterly Economic Commentary* (i.e., end 1991) out to the middle of the decade. In this concluding section we extend our horizon out to the end of the decade, pose a series of questions about how the economy is likely to evolve through the 1990s, and attempt to evaluate the role that public policy can play in bringing about a better outcome than a somewhat disappointing "steady as she goes" scenario would suggest.

Can one reasonably ask of economic analysis that it look beyond a five year time horizon? To do so, one must make a distinction between a "forecast" and a "scenario". When we carry out a forecast for a given period into the future, we take the most likely assumptions about the world economy and the stance of domestic policy, and then derive the most probable outcome for the economy on the basis of these assumptions. We may indeed present variants on this forecast (as in the previous chapter), but there is a strong sense in which we believe that the central forecast is the most likely outcome, given the present information which we have at hand. By *this* definition, we do not attempt to forecast the long-term prospects for the end of the decade.

In this Chapter we examine a "scenario", which is simply a possible or feasible outcome based on a given set of assumptions. To every different set of assumptions there is a corresponding different outcome and it is not possible to choose any given set of assumptions over any other. The crucial act of faith needed in carrying out analysis of long-term scenarios is that the ESRI Medium-Term Model will remain an adequate representation of the Irish economy over the rest of this decade. If that act of faith is made, then we can talk about a range of possible prospects for the economy.

The outline of our scenario is presented in Section 5.2 and is one where the world is assumed to continue to grow smoothly from mid-decade out to 2000 at a rate similar to its forecast performance in the early part of the decade, 1993-96. The artificial nature of this assumption should be apparent, since this type of behaviour has never held since the late 1950s. Who knows what global calamities lie just round the corner? Nevertheless, it represents a reasonable starting point for considering long-term issues.

Our assumption about domestic policy is similarly related to that made in the latter part of our central forecast, i.e., essentially the indexation of public expenditure programmes and only a very gentle cut in tax rates. In other words we assume a completely passive role for government, implying a forbearance that has seldom been exercised in the past and may not, indeed, be appropriate for the future.

Taking these assumptions, we then use the model to derive the consequences of this scenario and present the resulting performance of the economy. We shall show that this outcome has good and bad aspects, the bad aspects tending to focus attention on the poor performance of employment and unemployment. We examine these problems further in Section 5.3 in an attempt to explore possible better outcomes for Ireland by the end of the decade.

The long-term analysis presented in this section, together with the more detailed medium-term forecast presented in Section 4, serve to isolate two fundamental issues for the future development of the economy:

- (a) low levels of job creation, enduring high unemployment, high emigration outflows, and their relationship to the crucial issue of costs (in particular wage determination) in the private and public sectors, and
- (b) the optimal or desirable role of the public sector in improving the performance of the economy, constrained as it is by the inherited burden of debt from the previous decade and the failure of previous fiscal expansions.

In Section 5.4 we examine these issues and attempt to draw out the range of choices facing Irish policy makers and private sector agents. In effect we pose the questions: "What kind of economy do we *wish* to have by the end of the decade?"; "What kind of public and private actions *will work* towards an economy where the distributional consequences of high unemployment are removed, migration takes place purely on a voluntary basis, and jobs are available to all who actively seek them?". As one might expect, the possible answers to such weighty questions are never simple.

5.2 A SCENARIO FOR 2000

Let us imagine a scenario where, in the second half of the decade, the world economy evolves in a smooth and untroubled way. Growth in the OECD proceeds at a steady 2.5 per cent per annum (with Germany growing at just under 4 per cent). The key rate of long-term consumer price inflation in Germany is 2.5 per cent. Exchange rates within the EMS are fixed, and there is

no variation between the DM and the \$US, with some slight appreciation of the Yen against both. With very minor variations, world nominal interest rates have converged to 7.5 per cent in the latter half of the decade (i.e., 5 per cent in real terms). Finally, the UK labour market has almost fully recovered from the recession of 1991-1995, and the UK rate of unemployment has stabilized at about 8.5 per cent of the labour force.

These stylised assumptions are illustrated in Figure 5.1. With the exception of the high real interest rates, this could be characterised as a modestly optimistic scenario for the world economy, the modesty of the growth being more than offset by the optimistic assumption of the absence of any cyclical downturns such as characterised the years 1990-91.

These world and policy assumptions are fed into the model, which then generates the likely domestic economy consequences for the entire decade of the 1990s. We show in Figure 5.2 the summary effects on a range of Irish macro aggregates: growth, international and public sector balances, the debt/GNP ratio, inflation, employment and unemployment.

What this figure shows is that Ireland inherits a growth rate of GNP more in line with that of Germany than the lower OECD average (graph (a)). This is very much in keeping with performance in past decades, except for the period in the mid-1980s when the economy was being deflated.

The surplus on the balance of payments is sustained at about 2 per cent of GNP (graph (b)), driven by the export orientation of the industrial sector, the good level of competitiveness inherited from the latter part of the 1980s, and the assumed stance of fiscal neutrality.

The exchequer deficit of about 2 per cent of GNP on average in the first half of the decade is gradually transformed into a modest surplus of 1 per cent by the year 2000, driven by the indexation of policy instruments to prices, and resulting in a continual fall in the share of the public sector in the total economy.

As a direct consequence, the nation's public debt burden is gradually reduced as a per cent of GNP (it continues to rise in absolute terms out to 1997), falling from 112 per cent of GNP in 1990, to 93 per cent in 1996, and reaches 70 per cent by the year 2000 (graph (c)). This is a level more in keeping with present EC and OECD averages.

Figure 5.1
Scenario-2000 : World Economy Assumptions

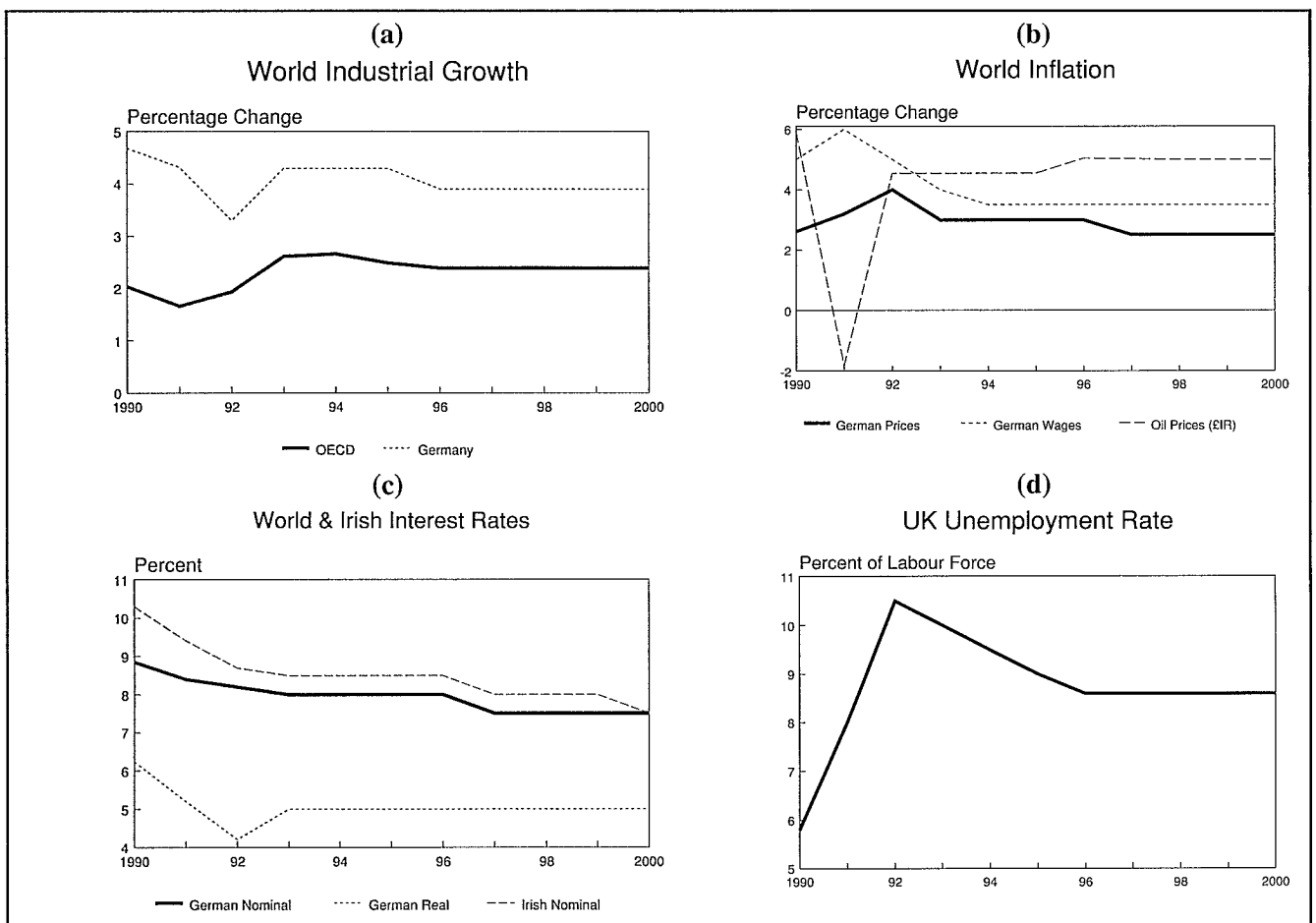
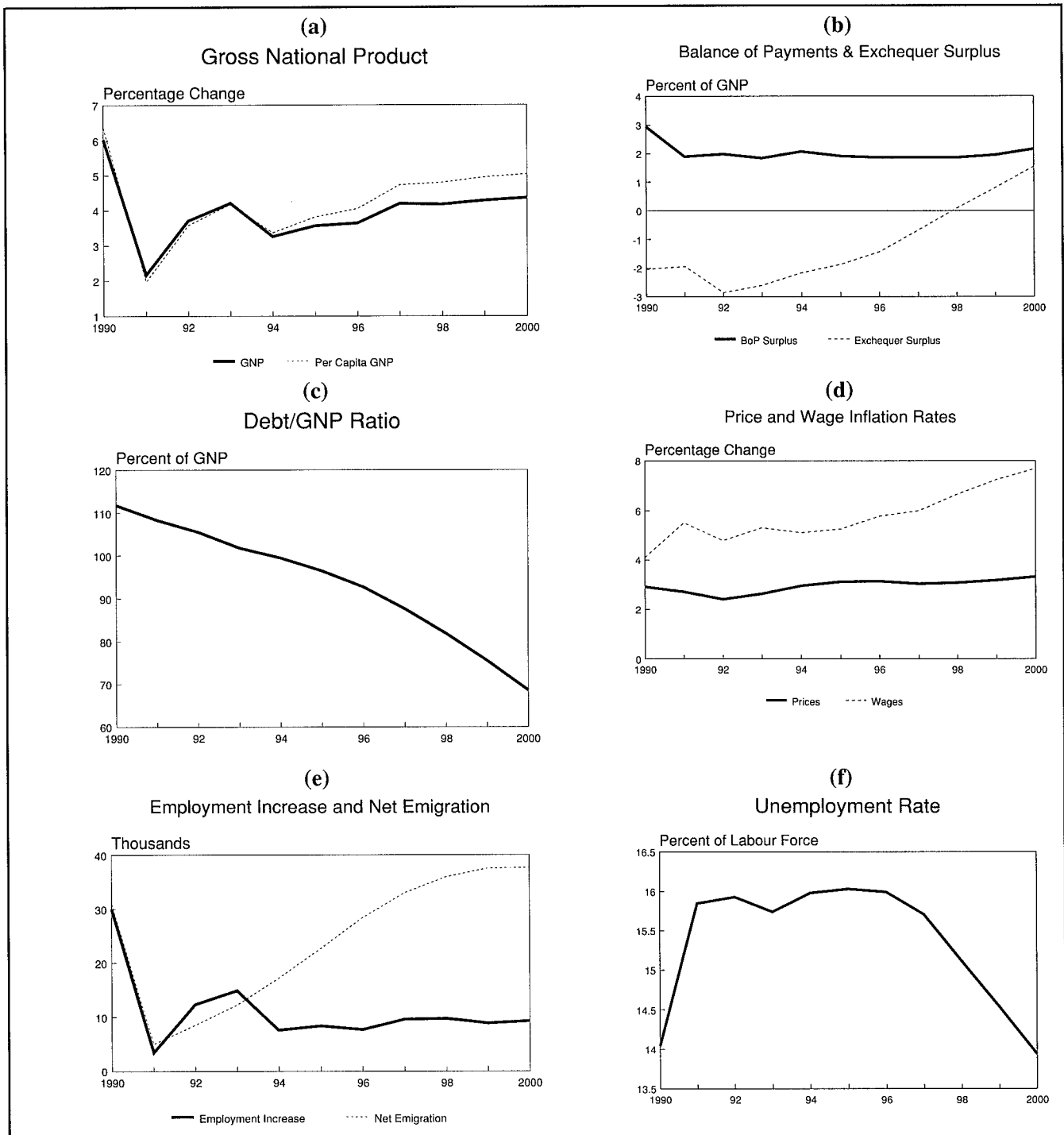


Figure 5.2
Scenario-2000 : Domestic Macroeconomic Implications



Irish consumer price inflation, at about 3 per cent per annum, is very much in line with German inflation (graph (d)). However, wage inflation, which remained at about 5 per cent per annum out to 1996, shows a tendency to rise gradually, to reach over 7.5 per cent by the year 2000. This is significantly above the German rate, and would require a more rapid rise in labour productivity in order to sustain the Irish cost competitiveness position. This has serious consequences for employment growth, which we now examine.

Perhaps the most disturbing graph is that showing the performance of total employment and emigration

(graph (e)). Here we see that the initial modest increase in employment creation in the years 1992-93 (where on average 14,000 net extra jobs were created per annum) tends to fade out, so from 1994 to the end of the decade the figure for net employment creation falls below 10,000 per annum. Emigration, which fell to a low of 5,000 in 1991 (as a result of the UK recession), gradually and inexorably rises to just under 40,000 per annum by the year 2000. In effect, this is the labour market scenario that the National Economic and Social Council found to be "entirely unacceptable" in its recent important study *A Strategy for the Nineties: Economic Stability and Structural Change*.

The main force driving Irish emigration is the high Irish rate of unemployment compared to the gradually improving UK labour market (graph (f)). The eventual modest fall in Irish unemployment, from a high plateau of 16 per cent over the years 1991-1996, to a value of 14 per cent by the year 2000, comes about mainly as a result of the resumption of high emigration rather than adequate net job creation. If one continued the simulation further into the next decade, the unemployment rate would continue to fall, and would stabilise at about 12-13 per cent of the labour force, or about 3-4 per cent higher than the 8.5 per cent UK rate.

To put it crudely, the fact that Irish workers effectively have the choice of working either in Ireland or in the UK means that the level of Irish real wages is partially determined by Irish labour market conditions, but also by conditions in the UK labour market. This hinders wage rates from being bid down sufficiently by labour market slackness (i.e., higher unemployment) to price Irish workers back into jobs.

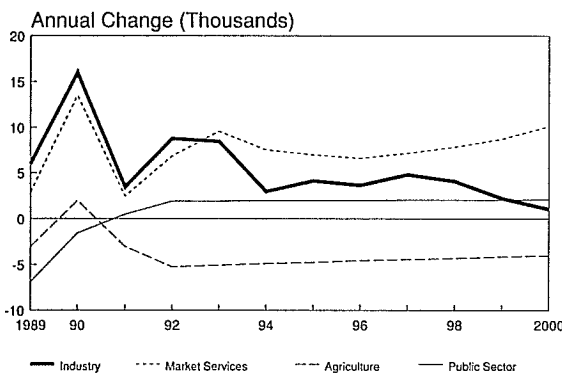
5.3 EXPLORING THE SCENARIO

Given the modest assumptions about the world economy, the performance of the Irish economy in our scenario, if not spectacular, is quite adequate on most counts: a growth rate at the upper end of world growth; balance of payments surpluses; modest exchequer deficits with eventual surpluses; a falling debt/GNP ratio; and no *serious* inflationary trends.

The one area of serious under performance is in the labour market. The rate of job creation is totally inadequate to prevent the unemployment rate rising in the absence of renewed high emigration. In our scenario a total of over 230,000 people emigrate between 1992 and 2000, slightly more than emigrated in the period 1983-1990. How and where does this under performance arise?

An examination of the different producing sectors of the economy and of the mechanisms of labour supply throws some light on the situation. In Figure 5.3 we show the annual change in employment by broad sector: industry, market services, agriculture and the public sector (i.e., public administration, health and education).

Figure 5.3
Net Employment Creation by Sector



Agriculture

With a brief modification in 1989-90, mainly due to reclassification of categories, employment in agriculture is projected to fall by between about 3,000 and 4,000 per annum. This would leave the agricultural work force at about 10 per cent of total employment by the year 2000. Agricultural labour shedding has little to do with economic processes in the non-agricultural part of the economy and the rate of job loss seems to be only mildly sensitive to general conditions in the rest of the labour market. Nothing in the experience of other EC states or in the prospects for agricultural policy generally within the EC holds out much prospect for a better outcome.

The Public Sector

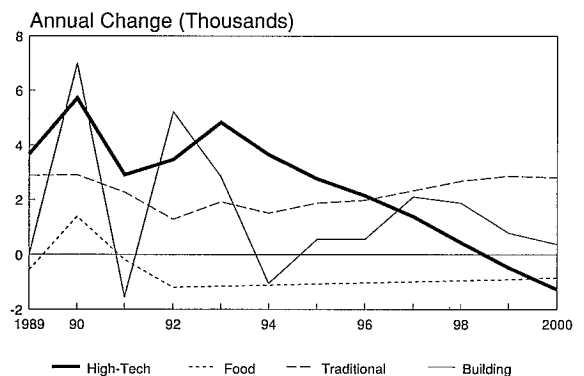
After the years of job cuts in the public sector during 1988-1990, our policy scenario assumption contained a resumed growth of public sector employment of 1 per cent per annum (i.e., about 2,000 jobs). This leaves the public sector share of total employment at 17.4 per cent in the year 2000, roughly the same share (17.1 per cent) it had in 1990 after the job cuts, and down from its historical peak of 19 per cent in 1987.

This growth in public sector employment is consistent with a declining debt/GNP ratio, from its present level of 112 per cent at end 1990 to about 70 per cent by the year 2000. Nevertheless, the costs of even this modest public sector job creation are seriously inflated by the projected rapid rise in earnings in this sector relative to the private sector for the period 1992-93, as discussed in Section 4 above and illustrated earlier in Figure 4.13.

Industry

Turning to the exposed industrial sector, the period 1992-93 sees the decade's strongest employment growth, averaging 9,000 per annum. This is followed by a gradual fall off in net industrial employment creation, to end the decade at a very mediocre net increase of merely 1,000 per annum. The annual change in employment in the main four sub-sectors of industry (i.e., high-technology, food, traditional, and building) is shown in Figure 5.4.

Figure 5.4
Net Employment Creation in Industry



The poorest performance is shown by the food processing sector of manufacturing, where labour shedding of about 1,000 per annum over the entire decade is projected. The reasons for this dismal projection were examined previously in Chapter 4, and relate to the constraints placed on the sector from existing excess capacity and the anticipated reform of the CAP. To project the poor performance of the first half of the decade out to the second half is perhaps to make a slightly provocative assumption about the inability of this sector to switch to a high value-added, employment generating mode of operation that would be so desirable.

In the high-technology sector the modest net job creation of the first half of the decade (under 4,000 net per annum) wanes in the latter part of the decade, and in the year 2000 there is an actual net loss of 1,300 jobs. Three reasons can be advanced for this disappointing behaviour:

- Our assumption of a modest rate of growth in the world economy, and its direct consequences for the level of foreign direct investment in Ireland;
- We have seen that wage inflation shows a tendency to remain higher than price inflation and to accelerate towards the end of the decade under the pressure of a declining rate of unemployment. This causes some systematic substitution of other inputs for labour, in this sector and elsewhere in industry;
- Our previous studies of the behaviour of this sector over the 1970s and 1980s have shown that technical progress is labour shedding. This means that as time passes it takes less labour to produce the same output, or, in other words, labour productivity rises.

So, the poor employment creation performance of the high-technology sector comes about as a result of these three factors: low world growth, relatively high cost inflation, and technology-driven high productivity. A considerably higher level of multinational direct foreign investment would be needed to improve this situation, stemming from higher world growth and/or increased Irish competitiveness.

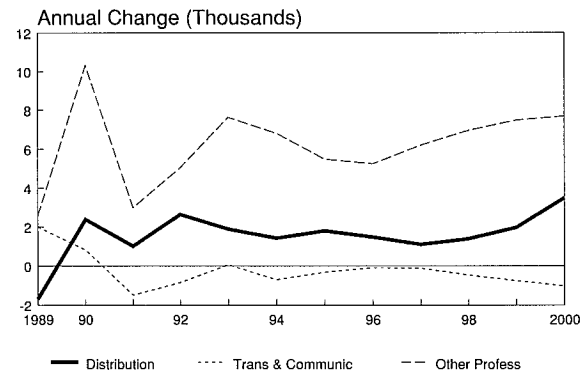
The net employment creation in the traditional sector remains steady at about 2,000 per annum over the whole decade. Here, the rate of labour shedding technical progress is less than for the high-technology sector, and the gradual loss of competitiveness over the decade is somewhat compensated for by the stimulus to domestic demand from higher incomes. This latter effect is, of course, completely absent from the high technology sector.

Finally, employment creation in building and construction initially shows the cyclical behaviour typical of this sector. The recovery in 1992/93 is mainly driven by the injection of EC Structural Funds (the CSF), and by the recovery elsewhere in the economy. However, the longer term net job creation is more modest, as the assumption of no further real increase in the CSF dominates public capital expenditure in the second part of the decade.

Market Services

Turning to the final source of sectoral employment, the annual net changes in employment in marketed services are shown in Figure 5.5.

Figure 5.5
Net Employment Creation Market Services



The poor employment performance of the Transport and Communication sector is apparent, and the reasons for this have been examined previously in Section 4. For the rest of the decade, this is likely to remain a technology driven sector, with any hiring in newer, growing, sectors of telecommunications merely compensating for labour shedding in other more traditional, labour intensive, areas such as the postal service.

Net employment creation in distribution runs at an average of about 2,000 per annum over the decade. The continual rationalisation of EC distribution networks will serve to attenuate employment growth in this sector, particularly in the early phases of the completion of the EC Single Market.

The most active net employment creation of all sectors takes place in the category of Professional and Other market services, averaging about 6,000 per annum. In effect, this is a type of residual sector with respect to employment and shows strong growth in most OECD countries as a result of industrial restructuring, financial sector innovation and advances in data processing technology. In addition, it has a possibility of generating export earnings, although these are mainly represented in our scenario in terms of tourism exports.

To summarise, in Figure 5.6 we show labour's share of added value in industry and market services over the extended period 1980 to 2000. The sharp decline in labour's share in industry (from a high of 72 per cent in 1980 to below 54 per cent in 1989) came about as a result of two factors. The high-technology sector became more dominant in aggregate manufacturing during the 1980s (Figure 5.7), and this sector has a much lower wage bill as a share of added value than the traditional sector or in building (Figure 5.8).

What our scenario for the 1990s shows is that labour's share of added value (equivalently, the profit share) tends to stabilize, and in the case of marketed services to rise slightly (equivalently, the profit share falls). This occurs under the pressure of a system of wage bargaining that is assumed to pass on a sizeable proportion of the benefits of growth to labour rather than to profits. Another implication is that real wages may rise significantly over the decade of the 1990s (Figure 5.9), in a way that is very much in keeping with average behaviour between 1960 and the early 1980s (Figure 5.10).

Figure 5.6
Labour's Share of Added Value

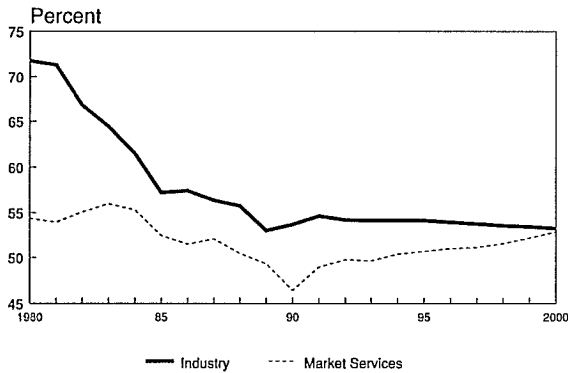


Figure 5.9
Nominal and Real Wage Inflation

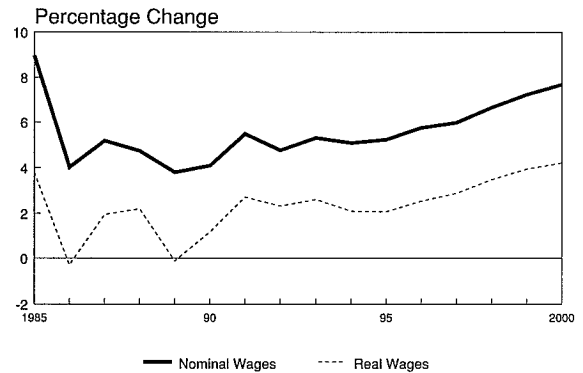


Figure 5.7
Share of Gross Manufacturing Output

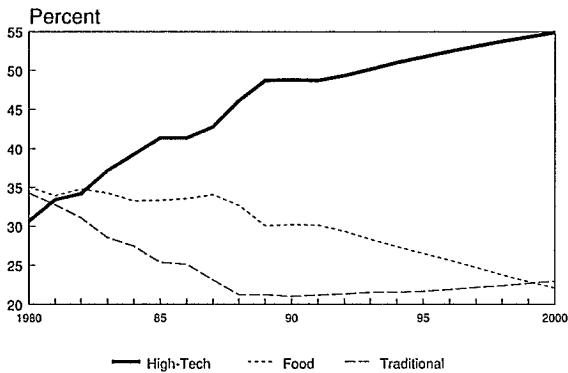


Figure 5.10
Nominal and Real Wage Inflation Behaviour in the 1960s, 70s and 80s

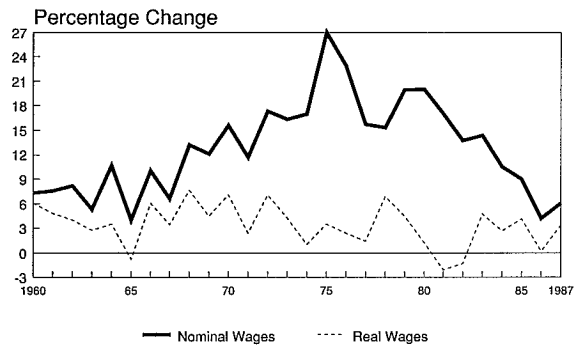
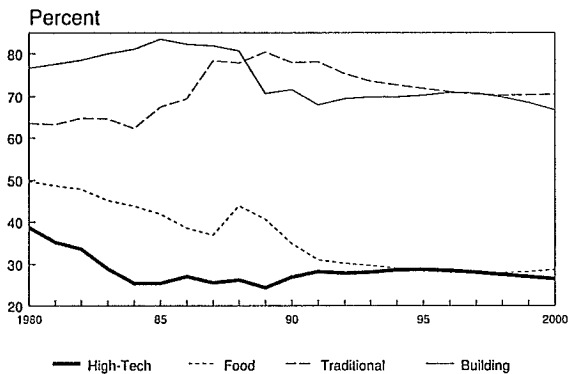


Figure 5.8
Labour's Share of Added Value



This poses a policy dilemma in very stark terms: would a better national outturn result if real wages did not rise and the benefits of the resulting higher competitiveness could be channelled into greater employment creation? We return to this issue in our concluding section below.

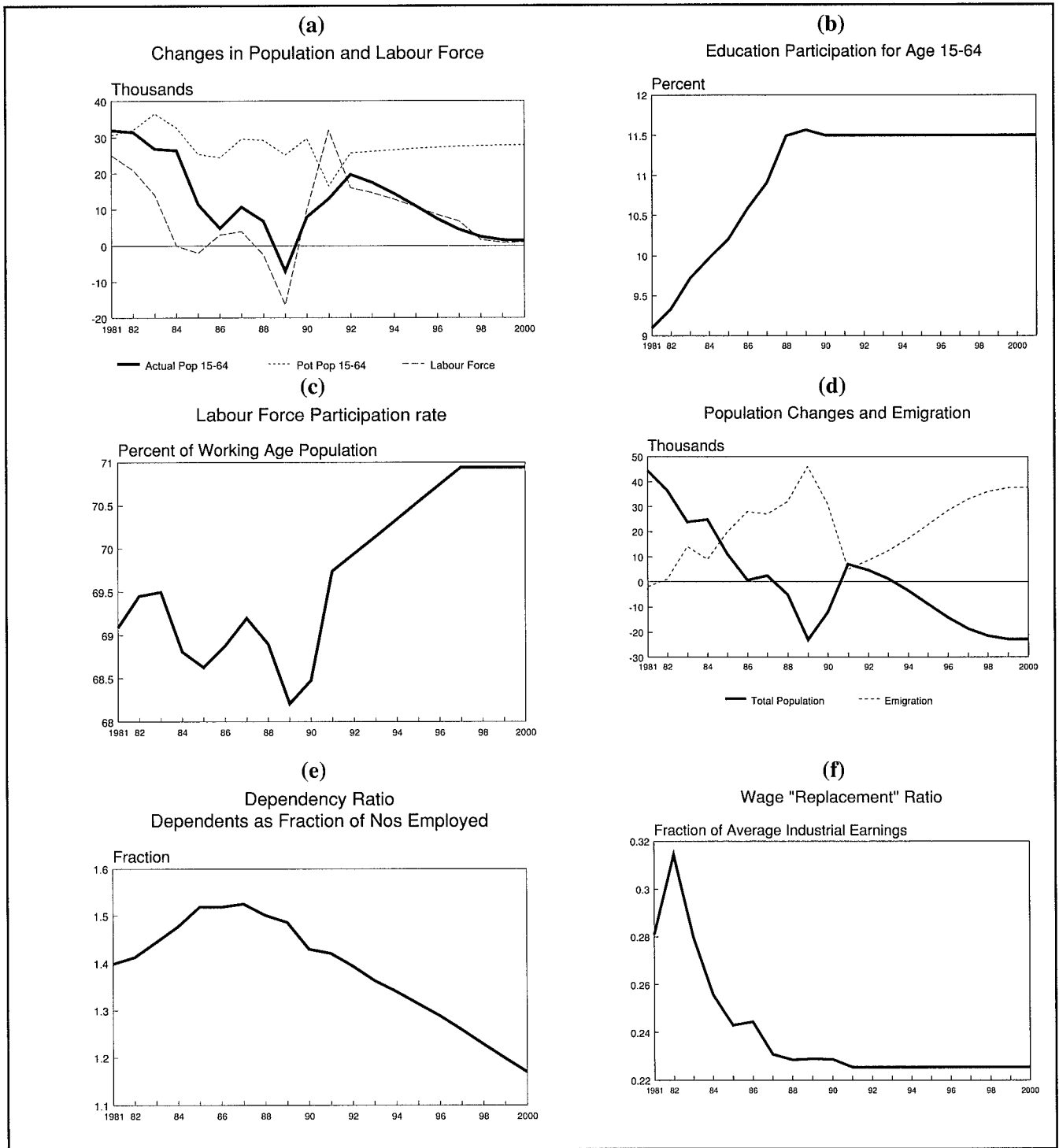
Labour Supply

Turning now to the projected characteristics of labour supply, the key features of the scenario are shown in Figure 5.11. In graph (a) we show the change in the working age population (i.e., aged 15-64) and the change in the labour force. Also shown in this graph is the "potential" population of working age, where we have "added back" the loss of working-age population due to migration.

For the 1980s, the rise in working age population was systematically larger than the rise in the labour force, due mainly to a steady increase in the proportion of those of working age who continued to participate in full-time education and training (graph (b)). For the decade of the 1990s, both measures move broadly in line, after a slight increase in the labour force participation rate in the early part of the decade (graph (c)).

Our assumptions about future behaviour of education and labour force participation (graphs (b) and (c)) are somewhat speculative and other possibilities could arise in the medium-term. For example, policy changes in the area of third-level education could permit an increase in participation, a factor that would temporarily remove people from the labour force. Ireland's present

Figure 5.11
Scenario-2000 : Labour Supply Behaviour



rates, while higher than the UK, are still lower than many other EC countries. With respect to overall labour force participation, here two offsetting forces are operating: a steady rise in the participation of married women, and a slow decline in overall participation due to earlier retirement.

The inter-relationship between population change and migration can be seen in graph (d), where the projected population increases of the period up to the mid-1990s are reversed thereafter as high levels of out-migration build up. With the projected temporary

slow-down in emigration (due to the UK recession), population remains roughly static at the start of the 1990s, and with the projected resumption of emigration the population declines steadily thereafter out to the year 2000.

Finally, two indicators of conditions in the supply side of the labour market are shown in graphs (e) and (f). In graph (e) we show a type of dependency ratio, i.e., the ratio of non-participants in the labour market (the young, old and those in full-time education) to those in gainful employment. This ratio rose steadily in the

1980s to a peak of 1.5 in mid-decade. For the 1990s it declines steadily, mainly for demographic reasons connected with the falling birth rate of the 1980s. In this respect, Ireland is very different from other EC countries with a more mature population age structure.

In graph (f) we show a measure of the "replacement ratio", i.e., the fraction of average earnings made up by unemployment transfers, commonly thought to be a factor influencing work incentives. This ratio peaked in the early 1980s, declined steadily thereafter, and is projected as constant during the 1990s as a result of our assumption of fiscal indexation.

Evaluation

In summary, our scenario simulation shows problems arising on both the demand and supply sides of the Irish labour market, and points to the inter-relation of both sides in explaining the projected continuing high rate of unemployment and resumed emigration. Feasible policy prescriptions designed to improve on this gloomy scenario must also address both sides of the labour market while respecting the constraints on the public finances which the National Economic and Social Council have stressed in their recent *Strategy* document.

Our long-term scenario is one that has been considered by the NESc, and decisively rejected. In the words of the Council:

"Not only would this be a failure to achieve the central aim of rapid employment growth, but it would imply a comprehensive failure to overcome the gross inequalities in Irish society which (...) are linked to unemployment", (page 413 of *A Strategy for the Nineties*).

What then can be done to produce a more acceptable scenario, i.e., basically one with higher employment growth, lower emigration, and a falling rate of unemployment, without compromising on the other desirable macroeconomic aspects. To look towards higher world growth would at best be wishful thinking, in the sense that the world economy is equally likely to grow faster as slower in our scenario assumption. Indeed, our global economy assumptions might even be considered on the optimistic side, and growth might be both slower and more erratic. In fact, a rate of world growth of 5-6 per cent (rather than 2.5-4 per cent) would be needed in order to make inroads into the Irish employment problem.

The NESc also found broad agreement among all the Social Partners that *"fiscal policy (should) not be used to stimulate the short-term growth of the economy, and that monetary and exchange rate policy be set to maintain the value of the Irish pound within the EMS"* (*Strategy*, page 414).

Having excluded the two options of higher world growth and general fiscal stimulation, what then is left? Within a binding constraint on the exchequer finances, the NESc proposed a series of "structural" reforms of public sector activities. In our concluding section we attempt to evaluate how desirable changes in private behavioural attitudes, together with this enlightened public policy stance, might work towards producing a better labour market outcome.

5.4 FRAMEWORK FOR POLICY

We have seen from the analysis of the scenario to the year 2000 that the central under-performance of the economy lies in prospective developments in the labour market. On the basis of unchanged policies, and with a moderately benign world economic performance, for the entire decade of the 1990s there is a serious risk of low levels of job creation, enduring high unemployment and heavy emigration outflows, particularly when the UK economy recovers from its present recession.

The root causes of these problems originate both within the labour market and in other areas of the wider economy. What, if anything, would work towards improving this situation and what constraints are there on such action?

The scope for domestic policy action at present remains limited by the problem of the public finances. Indeed, the last two budgets of 1990 and 1991 involved some relaxation of the stringent approach to the public finances of the years 1987-89. As a result, we forecast that the borrowing requirement (excluding privatisation revenues) may actually rise in 1991 and 1992. However, simple prudence dictates the need to moderate the excessively high debt/GNP ratio, and this must be borne in mind when examining the scope for policy initiatives for the rest of the decade and the appropriate long-term strategy for the public finances.

While there are severe constraints on fiscal policy there is an opportunity for new initiatives to promote the efficiency and broader competitiveness of the productive sector. What should be the strategy adopted to promote this development of the productive sector? We examine it under three headings: costs, pay and employment; the public finances; and medium-term development policy.

5.4.1 Unemployment and Pay

Economists have much to say about the possible causes of high and enduring unemployment, but less about practical and feasible solutions. Indeed, their advice is often unpalatable and negative, as they point to the likelihood that, with an unwillingness to change well established patterns of behaviour, in the short run there is little that public policy can do to alleviate the problem. At best one can hope that the income transfer and re-training systems will operate in such a manner as to mitigate the social injustices of involuntary unemployment, without destroying completely incentives to work.

Is there a solution to the problem of high unemployment in the longer term? The answer depends very much on what is felt to be an acceptable time-scale for improving the situation and how radical a change in behaviour is acceptable to employees and employers alike. For example, is it likely that, given time, a policy which concentrated on boosting cost competitiveness (i.e., mainly moderating the rise in labour and other input costs) could eventually bring about a situation where the nation-wide beneficial boost to job creation was deemed to compensate for the restrictions on individual income growth?

The negative aspects of such a policy are only too easy to see. While it might result in many more lower-paid jobs it might only marginally improve the overall average standard of living and the distribution of income. In addition, a strict voluntary incomes policy might still result in a loss of Irish skilled labour to higher paying jobs in the alternative UK labour market.

In order to have any chance of succeeding, any incomes policy would require presently employed skilled workers to trade off the desire for higher domestic wages, or for a higher standard of living in the UK, against the less tangible benefits to them of sustaining a competitiveness-driven higher rate of employment creation here in Ireland.

A Realistic Pay Policy

One reason for the poor labour market projections in our *scenario-2000* arises from our view of pay bargaining, as illustrated in the ESRI model of the economy (see article later in this *Review*). For example, past experience shows that each time unemployment falls, due to job creation or emigration, employees react by seeking higher real wages, choking off investment and future job creation (the "Phillips curve" effect). In addition, employees have generally received full compensation for increases in productivity.

Although this has been the pattern in the past, it need not remain so in the future. Legitimate questions to ask are:

- (a) "Can the structure of pay determination be changed from that which obtained in the 1960s, 70s and 80s, either to increase labour market flexibility (i.e., reduce this "Phillips curve" effect), or to compensate for it?"
- (b) "Does the historical behaviour of almost complete pass-through of productivity gains to wages lead to a worse employment/welfare position in the long-run compared with an alternative process of competitiveness / investment led growth?"
- (c) "Are there realistic policies that might assist movement in the above directions, in order to maximise job creation in Ireland?"

It must be said that the above processes of productivity pass-through and market flexibility may *already* have been modified in the *exposed* internationally trading sector by the acceptance, by workers and employers alike, that fixed EMS exchange rates are here to stay. Hence, our scenario projection of unchanged behaviour patterns may be excessively pessimistic, although the jury is still out on the issue.

If this shift in expectations is to be consolidated, equal realism must spread to the sheltered sector, including the public service. In this respect, the recent ESB strike was not an encouraging development. The "principle" of comparability should play a lesser role in pay determination than in earlier decades. Even where the presentation of public sector pay deals appears to curtail or exclude the danger of "leap-frogging" claims, the enshrinement of the comparability "principle" builds undue rigidity into the pay structure in the face of changing economic, social and technical circumstances.

As discussed earlier in chapter 4, the central forecast shows average earnings rising much more rapidly in the public sector than in industry over the next three years. This increase in differential does not appear to be warranted by a claim of slower growth of public sector incomes in the past. If it continues it is likely to pose serious problems for pay bargaining in the private sector and it could jeopardise the development of a more realistic pay policy in the future through "spill-over" effects.

Responses to the recent recruitment initiatives in the public sector, and areas of market services, usually take the form of massive over-application by young people seeking their first jobs. The success of the banks and Aer Lingus in introducing new lower grades, together with the difficulty of holding on to skilled senior staff in areas of the public sector, suggests that the pay gradient, especially in the public sector, is too shallow. Restricting, or reducing recruitment grade pay, combined with the prospects of a proper career structure, would move the system in the direction indicated by market forces.

This suggests strongly the need for radical modifications to the structure of the present PESP, or its successor, where concessions by mainly public sector trades unions in the area of pay flexibility might permit a major shift in the pattern of employment creation in the public and private sectors alike.

Combined with revenue-neutral tax reform, which could reduce upward pressure on wages via the "tax wedge", the possibility opens for a slower than predicted rise in real wages, which could push the economy in the direction of faster than predicted growth in productive investment, output and employment in industry and market services.

5.4.2 The Public Finances

While much public attention is currently focused on the likely overrun in the exchequer borrowing requirement, this is only one aspect of a wider problem of public sector indebtedness. If the 1990 and 1991 budgets had maintained a tougher stance on reducing public expenditure and resisted the pressures for tax cuts, any prospective cyclical overrun would be perceived as unimportant by financial markets.

However, the EBR target in the 1991 budget was already too soft. Furthermore, in the light of the likely high public service special pay awards contained in the recent PESP and the need to harmonise taxes to prepare for 1992, budgetary control is still an important issue.

Given the deterioration in the world economy and the higher level of interest rates that have occurred over the last two years, the costs of high levels of debt have increased and the imperative to eliminate the borrowing requirement is reinforced. This change in the external environment has made it more important than before that the debt/GNP ratio target of 100% of GNP by 1993 be attained.

Instead, fiscal policy has been relaxed, and in our central forecast we suggest that on unchanged policies the debt/GNP target of 100% will not be reached until 1994 at the earliest. It is also disturbing that the higher level of public expenditure being financed by further debt accumulation is being used partly to fund higher wages in the public sector, an action that must militate against the stated aim of public policy to reduce the rate of unemployment in the long term.

While the receipts of privatisation may facilitate the achievement of budgetary targets this year, they should not be treated as easing the path towards the 1993 debt/GNP target. For example, if proceeds from the sale of Irish Life are used to reduce the borrowing requirement, it must be realised that this also reduces the asset position of the public sector. If a full balance sheet for the public sector were drawn up, it would be seen that such transactions would do nothing in the short term to ease the state's problem of high indebtedness. A *valid* argument for privatisation is that it will increase overall efficiency in the relevant public sector enterprises, not that privatisation is an opportune cash windfall with which to pay off public sector debts.

One must not lose sight of the fact that the public debt issue is essentially of a medium-term character and must be tackled in the context of a medium-term strategy. The necessary question to pose is: "What should be the appropriate policy on public sector debt reduction in the next five years?" Approaches to this issue are conditioned by the enormous risks which attach to a high level of debt and the costs in terms of future output forgone to pay the interest on the debt.

The problem of debt stability was tackled in the latter part of the 1980s and, on the basis of reasonable assumptions, does not now pose a threat equal in magnitude to that of the early 1980s. The severity of continued fiscal contraction is, to some extent, a matter of domestic choice.

The fact that our debt is so high means that over 7 per cent of GNP is preempted by interest payments. Furthermore, it leaves us extremely vulnerable to shocks to the world financial system and the degree of uncertainty about the future is magnified by the sheer size of our debt. A lower level of debt would mean that future interest rate shocks would have a less disruptive impact on the essential business of government. The possible magnitude of such disruptive effects have already been illustrated in our analysis of the consequences of higher German interest rates. Any further sudden and sustained rise in interest rates, as occurred in the 1980s, could prove very disruptive, necessitating the postponement or abandonment of many planned public sector infrastructural and other investments.

Just as private individuals should plan their finances in a prudent fashion, so too should governments seek to maintain a level of debt which leaves sufficient room for manoeuvre in the face of future unexpected shocks to the world economy. Experience in other countries in Northern Europe suggests that a debt/GNP ratio of between 50-75 per cent of GNP is appropriate and this is the level that Irish policy makers should aim for during this decade. This was recognised in the recent *Programme for Economic and Social Progress* which expressed the view that the rate should be "75% of GNP or below by the year 2000".

While the need to manage risk (i.e., prudential considerations) provides the over-riding incentive to reduce the debt/GNP ratio, it does not indicate how rapidly this task should proceed. Without a doubt, the present high debt ratio is a major factor in keeping Irish living standards down, taxes high, and growth below what it could otherwise be. It also affects Ireland's international competitiveness and attractiveness for investment.

The competitiveness effect of high indebtedness will become even more important with the development of the Single Market, as highlighted by the mounting pressures for EC-wide tax harmonisation. Countries with high debt ratios will find themselves with high taxes, not to pay for a high level of public services, but rather to pay for past consumption. If taxes are kept high to pay the interest bill, the burden will tend to price the productive sector out of its EC markets through its upward pressure on wages.

Alternatively, if services have to be cut to pay the interest, living standards will fall with consequential labour market effects in an open economy like Ireland. This is a problem, not just for Ireland, but for other heavily indebted EC members such as Denmark and Belgium.

Ideally, the medium-term aim should be to reduce the debt/GNP ratio to average EC levels in the range 50-75 per cent of GNP to minimise the competitiveness loss. The optimum time path for reduction in the debt ratio depends both on the need to reduce our exposure to world shocks and on our willingness to postpone current expenditure to reap the future benefits of improved competitiveness which will flow from a lower debt. The minimum requirements would seem to be as follows:

- (a) A *rapid* reduction of the debt/GNP ratio to under 100 per cent, mainly on prudential grounds.
- (b) Continuous, if gradual, reduction thereafter, towards average EC levels of 50-75 per cent.

Budgetary policy must be clearly and unambiguously targeted at these goals, in order to reap all the benefits of policy credibility. The central thrust of policy must not be deflected by short-term issues.

5.4.3 Development Strategy

Simply holding down pay, both absolutely and as a proportion of net output, may be a *necessary* condition for faster employment growth, but it is unlikely to be *sufficient* in itself to stimulate an adequate increase in jobs. Our examination of the working of the economy also highlighted the fact that permanent increases in output can not be achieved by public sector stimulation of domestic demand. If ever such a policy had any shred of credibility, the history of the period 1975-86 should finally disabuse holders of such a view.

Public expenditure and taxation policies must be directed towards increasing the efficiency, competitiveness and productivity of the *trading* sectors of the economy. Such policies should aim at reducing the costs of production in Ireland, in order to attract higher levels of production, investment, employment and real wages in the long-run. Public policy must work in concert with the market economy, not against it.

However, policy must recognise certain inescapable facts of economic life if they are to succeed in encouraging the growth of employment:

- (a) the need for *growth* in output, not merely for a *redistribution* of an unchanged volume of output;
- (b) the need to observe a rigorous public finance constraint;
- (c) the openness of the Irish economy to outside influences both through trade and migration, leading to a relative lack of economic autonomy;
- (d) the fact that action to change the structure of the economy may take a considerable time to take effect.

In spite of the pressures for an instant response to our current problems it is necessary to stress the need to take a longer time horizon. Many of the potentially worthwhile changes which could be made to the structure of the economy would take some years to show their full benefits. For example, investment in education and changes to industrial policy have very long term consequences, and produce limited short-term benefits.

In an increasingly integrated EC economy the central objective of development policy must be the promotion of greater efficiency in the market sector of the economy, since it is only through the improvement in our competitive position that we can hope to promote a more rapid growth in output.

We have already discussed how the development of a realistic pay policy could contribute to this objective. However, in the longer run pay costs are only one of the elements which go to make a competitive economy. Containment of other input costs, such as energy, telecommunications and transport, can all contribute to the economy's performance. In addition, it is possible to improve the efficiency and competitiveness of the economy by raising the productivity of the different factors of production without changing their price or pay. For example, a more skilled and educated workforce produce more and higher quality output. Higher productivity is ultimately the only way to achieve rising living standards.

It is possible that our model-based *scenario-2000* has underestimated the likely impact of measures already taken in respect of, for example, tourism. The considerable investment being financed as part of the EC CSF may also effect a reduction in costs and an increase in productivity over and above the figures shown earlier in this Chapter. However, it is clear that more needs to be done. Within the constraints of the public finances, some sharper focussing of development strategy is needed.

The National Economic and Social Council strategy embraces five main areas of policy: macroeconomic policy; tax/public expenditure reforms; incomes policy; development policy and manpower policy. Within these areas, they have identified many different opportunities for *public* policy action to improve market efficiency and labour productivity:

(a) a broadly based and wide-ranging tax reform, with reductions in average and marginal direct tax rates, financed largely by a widening of the tax base. This would ease pressures for wage increases by shifting the tax burden to other forms of income. This could in turn increase competitiveness and output;

(b) changes in social welfare (specifically a move to a single, lower rate of employee's PRSI), taxation of short-term benefits, etc., with the aim of removing well-known labour market disincentive effects and poverty traps;

(c) implementation of a comprehensive policy with respect to housing, in order to increase mobility within the labour market, and introduction of a domestic property tax to redress the present built-in bias towards excessive investment in property rather than employment creation;

(d) reforms in the management of public enterprises, with a view to reducing the cost of services inputs to the exposed internationally trading sector;

(e) A renewed emphasis on education and training.

The NES C sees manpower policy as having two strands: the first involves a reallocation of public expenditure to fund an enhanced manpower policy to tackle unemployment in the short-term; the second is aimed at increasing the productivity of industry and services to encourage the development of businesses employing high-paid high-skilled labour.

The range of short-term measures which the NES C propose could cut unemployment. However, they face problems of resources and of management. The proposal is to fund these measures by a redirection of expenditure from other areas. It must be questioned whether the willingness is there to redirect funds in this way. In the past there have been problems in implementing training and other manpower schemes effectively. If the NES C strategy is to succeed there will have to be very close monitoring of any new initiatives and a willingness to be flexible if individual measures are found to be ineffective.

It is not our present purpose in this *Review* to add to, or evaluate, this very comprehensive set of proposals. If successful they can be expected to promote the development of the economy through a number of different channels. However, a pragmatic, systematic, and quantitative evaluation of the likely benefits to job creation of the NES C proposals is clearly needed.

The impact of the EC Community Support Framework has recently been analysed by the ESRI, using a combination of detailed microeconomic studies of individual sectors within the macroeconomic framework of the ESRI model (*The Role of the Structural Funds: Analysis of Consequences for Ireland in the Context of 1992*, by John Bradley, John Fitz Gerald and Ide Kearney, to appear, ESRI Policy Series, Summer 1991). Work is under way on a similar analysis of the more complex and qualitative NES C proposals.

Realistically the fruits of development policies will take time to bear fruit. Children who benefit from developments in education today might not enter the labour market until the end of the decade. In the past, this has made education an unattractive area for investment in times of serious jobs crises.

Education should not be seen as being merely a preparation for instant entry into the labour market. It is no accident that the most successful countries in Northern Europe have long had well developed educational systems. In the case of Ireland, full state funding of secondary education was only introduced in the late 1960s and participation in second level education has risen over the subsequent twenty years. As a result, the work-force under the age of thirty-five is now better educated than was the previous generation. If the experience of other countries is anything to go by, one may expect the fruits of this higher level of education to produce a pay-back over a very long time period.

Even if there is no apparent present shortage of skilled labour, the absence of certain skills may result in new firms choosing to by-pass Ireland. Undoubtedly the increased availability of skilled and highly educated labour in the 1980s has contributed to the growth in the computer industry in Ireland. New firms, such as INTEL, would not have chosen to locate in Ireland were it not for the availability of the skills which they need. In this case training and education has helped increase the demand for labour in specific high-technology industries and has brought other "down-stream" benefits to other sectors of the economy.

At the opposite end of the range of education and skills, experience has shown that those entering the labour market with no skills and little education have very poor prospects of finding permanent employment. If effective intervention can be made to provide them with a better training for the labour market then they will be in a position to compete for employment. While this will not of itself create more employment, it may make them active participants in the labour market and contribute to a more realistic pay policy. However, it should be said that research has shown that the training and education system has, so far, not been very suc-

cessful in assisting the truly disadvantaged. A more successful approach must be found, for the root cause of Ireland's problem of structural or long-term unemployment lies in this area of disadvantage and deprivation.

The long-term nature of such policies should not permit policy makers to become side-tracked by *ad hoc*, short-term, temporary palliatives, which, while politically attractive, are no substitute for a coherent development strategy. What we need to do is to build on, and implement, some of the wide range of options put forward by the NESC and contained within the PESP. Because of the uncertainty in this area we must expect some of the initiatives to fail. As a result, it will be important to monitor the progress of all measures designed to promote the long term development of the economy and to concentrate on those which show the best prospects of bringing about a more rapid growth in output by the turn of the century.

Writing recently about the prospects for the US economy in *The Age of Diminished Expectations*, Paul Krugman states: "For the economy, the important things - the things that affect the standard of living of large numbers of people - are *productivity, income distribution* and *unemployment*. If these things are satisfactory, not much else can go wrong, while if they are not, nothing can go right. Yet very little of the business of economic policy is concerned with these big trends".

Although in the first two items of Krugman's list, productivity and income distribution, Ireland is in some ways better off than the US, it is important to realise that we are achieving little success in addressing the third item, unemployment. While this is partially explained by a lack of policy autonomy, it is also due to the obvious painfulness of the measures we would have to take if we were really serious about changing things.

APPENDIX

This appendix contains a set of tables giving additional details of the central forecast discussed in Section 4.

TABLE A.1: Output

	1990 £M	Volume %	Price %	1991 £M	Cont. to Growth %	Volume %	Price %	1992 £M	Cont. to Growth %
Agriculture	2207	0.4	-6.8	2066	0.0	0.3	0.6	2085	0.0
Industry	8375	3.9	0.9	8780	1.8	4.2	4.2	9525	1.9
Manufacturing	6495	4.2	-0.3	6748	1.5	3.9	4.4	7323	1.5
Utilities	554	5.0	1.1	588	0.2	6.0	-0.5	620	0.2
Building	1326	1.0	7.9	1444	0.1	4.4	5.0	1582	0.2
Market Services	9651	1.7	-1.8	9638	0.7	4.0	0.5	10078	1.6
Distribution	2728	1.7	0.1	2780	0.2	3.3	2.3	2936	0.4
Transport & Communications	1633	1.7	0.1	1663	0.1	3.7	1.4	1749	0.2
Professional & Financial	5290	1.7	-3.5	5195	0.4	4.5	-0.7	5394	1.0
Non-Market Services	3793	0.4	8.9	4148	0.1	1.2	7.8	4525	0.2
Health & Education	2493	0.4	9.1	2730	0.0	1.0	8.0	2978	0.1
Public Administration	1300	0.5	8.6	1418	0.0	1.4	7.5	1547	0.1
Adjustment for Fin. Services	1100	3.8	2.5	1170	0.2	5.4	3.0	1270	0.3
GDP at Factor Cost	22926	2.3	0.1	23463	2.4	3.3	3.0	24944	3.4
Taxes on Expenditure	4450	2.0	1.1	4588	0.4	2.6	1.2	4767	0.5
Subsidies	1830	1.0	-21.5	1450	0.1	1.2	-4.5	1400	0.1
GDP at Market Prices	25546	2.3	1.8	26601	2.7	3.3	3.0	28310	3.8
Net Factor Income	-2878	3.2	-0.9	-2942	-0.5	0.6	3.5	-3062	-0.1
GNP at Market Prices	22668	2.2	2.1	23659	2.2	3.7	2.9	25248	3.7

	1992 £M	Volume %	Price %	1993 £M	Cont. to Growth %	Volume %	Price %	1994 £M	Cont. to Growth %
Agriculture	2085	0.3	0.3	2096	0.0	0.3	0.7	2118	0.0
Industry	9525	4.6	3.3	10294	2.2	4.2	1.7	10912	2.0
Manufacturing	7323	4.5	3.5	7920	1.7	4.7	1.8	8441	1.7
Utilities	620	6.1	0.3	660	0.2	4.6	0.2	692	0.2
Building	1582	4.5	3.7	1714	0.2	0.9	2.8	1779	0.0
Market Services	10078	4.9	3.0	10888	1.9	3.6	1.9	11489	1.4
Distribution	2936	4.2	2.9	3145	0.5	2.1	2.8	3302	0.2
Transport & Communications	1749	4.4	-0.2	1821	0.3	3.8	-0.5	1881	0.3
Professional & Financial	5394	5.5	4.0	5922	1.2	4.3	2.1	6306	0.9
Non-Market Services	4525	1.2	7.8	4936	0.2	1.2	4.9	5240	0.2
Health & Education	2978	1.0	8.0	3248	0.1	1.0	5.1	3448	0.1
Public Administration	1547	1.4	7.5	1688	0.1	1.4	4.7	1792	0.1
Adjustment for Fin. Services	1270	6.2	3.6	1396	0.3	4.9	2.1	1495	0.3
GDP at Factor Cost	24944	3.8	3.6	26819	3.9	3.2	2.1	28263	3.3
Taxes on Expenditure	4767	4.7	0.7	5027	0.9	2.3	3.0	5299	0.4
Subsidies	1400	1.8	0.1	1427	0.1	1.0	0.6	1450	0.1
GDP at Market Prices	28310	4.1	3.3	30419	4.7	3.2	2.3	32111	3.7
Net Factor Income	-3062	3.1	3.0	-3253	-0.5	2.6	2.3	-3415	-0.4
GNP at Market Prices	25248	4.2	3.2	27166	4.2	3.3	2.3	28696	3.3

	1994 £M	Volume %	Price %	1995 £M	Cont. to Growth %	Volume %	Price %	1996 £M	Cont. to Growth %
Agriculture	2118	0.3	0.7	2139	0.0	0.3	0.5	2158	0.0
Industry	10912	4.5	2.0	11626	2.1	4.6	2.4	12459	2.2
Manufacturing	8441	4.9	1.9	9024	1.8	5.0	2.5	9716	1.9
Utilities	692	4.5	0.4	726	0.2	4.4	0.9	765	0.2
Building	1779	1.7	3.8	1876	0.1	1.9	3.5	1978	0.1
Market Services	11489	4.0	2.1	12202	1.6	4.2	2.4	13019	1.7
Distribution	3302	2.8	3.3	3508	0.3	3.0	3.9	3753	0.3
Transport & Communications	1881	4.1	0.2	1963	0.3	4.3	0.9	2065	0.3
Professional & Financial	6306	4.7	2.0	6731	1.0	4.8	2.1	7201	1.1
Non-Market Services	5240	1.2	5.1	5570	0.2	1.2	5.6	5950	0.2
Health & Education	3448	1.0	5.3	3666	0.1	1.0	5.8	3916	0.1
Public Administration	1792	1.4	4.8	1905	0.1	1.4	5.3	2034	0.1
Adjustment for Fin. Services	1495	5.3	2.3	1610	0.3	5.5	2.7	1745	0.3
GDP at Factor Cost	28263	3.5	2.3	29928	3.6	3.6	2.7	31841	3.7
Taxes on Expenditure	5299	2.7	3.1	5612	0.5	3.0	3.1	5961	0.5
Subsidies	1450	1.2	0.6	1477	0.1	1.3	0.7	1506	0.1
GDP at Market Prices	32111	3.5	2.5	34064	4.0	3.7	2.8	36296	4.2
Net Factor Income	-3415	3.1	2.3	-3601	-0.5	3.7	2.6	-3835	-0.6
GNP at Market Prices	28696	3.6	2.5	30462	3.6	3.6	2.8	32461	3.6

TABLE A.2: Personal Income and Personal Expenditure
Current Prices, £ Million

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Agricultural Incomes	1605	1878	1962	1855	1706	1704	1699	1705	1712	1715
Non-Ag. Wage Income	10488	10982	11709	12558	13343	14327	15479	16456	17528	18750
Transfer Income	3605	3708	3737	3903	4158	4321	4484	4663	4841	5023
Other Personal Income	2585	2431	2642	3018	3230	3463	3752	3870	4071	4305
Non-Ag. Profits etc.	4834	5372	6135	6775	7015	7523	8176	8526	9029	9641
Financial Serv. adj. (-)	884	968	1058	1100	1170	1270	1396	1495	1610	1745
National Debt Interest	1944	2015	2032	2169	2220	2187	2256	2333	2413	2498
Net Factor Income	-1957	-2542	-3039	-2878	-2942	-3062	-3253	-3415	-3601	-3835
Government Trad. Inc.(-)	481	470	368	436	490	450	465	475	487	501
Other Private Income	3456	3407	3702	4530	4633	4928	5318	5473	5742	6059
Undistributed Profits (-)	871	976	1060	1512	1403	1465	1566	1603	1671	1754
Personal Income	18282	18999	20050	21334	22437	23814	25414	26694	28152	29793
Taxes on Personal Income	3999	4463	4300	4602	4875	5168	5428	5741	6049	6411
Personal Disposable Income	14284	14536	15750	16732	17562	18646	19986	20953	22104	23382
Personal Consumption	11784	12375	13523	14301	15016	15757	16928	17789	18811	19946
Personal Savings	2500	2161	2227	2431	2546	2890	3057	3163	3293	3437
Tax Ratio (% Pers. Income)	21.9	23.5	21.5	21.6	21.7	21.7	21.4	21.5	21.5	21.5
Savings Ratio (% Disposable Income)	17.5	14.9	14.1	14.5	14.5	15.5	15.3	15.1	14.9	14.7

TABLE A.3: Expenditure on GNP

	1990 £M	Volume %	Price %	1991 £M	Cont. to Growth %	Volume %	Price %	1992 £M	Cont. to Growth %
Personal Consumption	14301	2.2	2.7	15016	1.5	2.5	2.4	15757	1.6
Public Consumption	4010	0.5	9.1	4396	0.1	1.0	6.8	4740	0.2
Fixed Investment	4665	3.6	3.6	5005	0.8	7.3	3.4	5549	1.6
Building	2275	0.8	5.1	2411	0.1	7.8	3.7	2697	0.8
Machinery	2390	6.0	2.4	2594	0.7	6.8	2.9	2848	0.8
Final Domestic Demand	22976	2.2	3.9	24417	2.3	3.2	3.3	26046	3.3
Stock Building	560			340	-0.9			29	-1.2
Agricultural	98			20	-0.4			1	-0.1
Intervention	446			320	-0.4			1	-1.3
Non-Agricultural	16			0	-0.1			27	0.1
Total Domestic Demand	23536	1.3	3.8	24757	1.4	2.0	3.3	26076	2.1
Total Exports	15915	5.4	-0.9	16629	4.7	7.5	3.5	18496	6.7
Merchandise	14192	5.6	-1.3	14785	4.4	7.9	3.7	16552	6.4
Services	1723	4.1	2.7	1843	0.3	3.0	2.4	1943	0.2
Total Demand	39451	3.2	1.7	41386	6.1	4.5	3.0	44572	8.8
Total Imports	13905	4.4	1.8	14785	3.4	6.3	3.4	16261	4.9
Gross Domestic Product	25546	2.3	1.8	26601	2.7	3.3	3.0	28310	3.8
Net Factor Income	-2878	3.2	-0.9	-2942	-0.5	0.6	3.5	-3062	-0.1
Gross National Product	22668	2.2	2.1	23659	2.2	3.7	2.9	25248	3.7

	1992 £M	Volume %	Price %	1993 £M	Cont. to Growth %	Volume %	Price %	1994 £M	Cont. to Growth %
Personal Consumption	15757	4.7	2.6	16928	3.0	2.1	3.0	17789	1.4
Public Consumption	4740	1.0	6.9	5117	0.2	1.0	4.6	5408	0.2
Fixed Investment	5549	5.2	3.1	6020	1.1	1.9	2.7	6303	0.4
Building	2697	5.7	3.2	2942	0.6	1.2	2.7	3056	0.1
Machinery	2848	4.8	3.0	3073	0.6	2.6	2.9	3243	0.3
Final Domestic Demand	26046	4.2	3.4	28065	4.3	1.9	3.2	29500	1.9
Stock Building	29			60	0.1			87	0.1
Agricultural	1			1	0.0			1	0.0
Intervention	1			1	0.0			1	0.0
Non-Agricultural	27			58	0.1			85	0.1
Total Domestic Demand	26076	4.4	3.4	28125	4.5	2.0	3.2	29587	2.0
Total Exports	18496	6.6	3.0	20314	6.1	6.2	2.3	22059	5.8
Merchandise	16552	6.9	3.1	18253	5.8	6.4	2.3	19872	5.6
Services	1943	3.3	2.6	2061	0.3	3.1	3.0	2187	0.2
Total Demand	44572	5.4	3.1	48439	10.6	4.0	2.5	51646	7.8
Total Imports	16261	7.3	3.3	18020	5.8	5.1	3.2	19535	4.1
Gross Domestic Product	28310	4.1	3.2	30419	4.7	3.2	2.3	32111	3.7
Net Factor Income	-3062	3.1	3.0	-3253	-0.5	2.6	2.3	-3415	-0.4
Gross National Product	25248	4.3	3.2	27166	4.3	3.3	2.3	28696	3.3

	1994 £M	Volume %	Price %	1995 £M	Cont. to Growth %	Volume %	Price %	1996 £M	Cont. to Growth %
Personal Consumption	17789	2.5	3.1	18811	1.6	2.8	3.1	19946	1.8
Public Consumption	5408	1.0	4.8	5724	0.2	1.0	5.2	6083	0.1
Fixed Investment	6303	4.0	2.9	6744	0.9	4.0	3.0	7223	0.9
Building	3056	3.4	3.0	3253	0.3	3.6	3.0	3471	0.4
Machinery	3243	4.5	2.9	3485	0.5	4.4	3.0	3745	0.5
Final Domestic Demand	29500	2.6	3.3	31278	2.7	2.8	3.4	33252	2.8
Stock Building	87			115	0.1			146	0.1
Agricultural	1			1	0.0			1	0.0
Intervention	1			1	0.0			1	0.0
Non-Agricultural	85			113	0.1			144	0.1
Total Domestic Demand	29587	2.7	3.3	31394	2.8	2.9	3.4	33398	2.9
Total Exports	22059	6.1	2.3	23937	5.9	6.0	2.6	26045	6.0
Merchandise	19872	6.3	2.3	21606	5.6	6.2	2.6	23555	5.7
Services	2187	3.4	3.1	2332	0.3	3.5	3.1	2490	0.3
Total Demand	51646	4.4	2.7	55331	8.7	4.4	2.9	59443	8.9
Total Imports	19535	5.5	3.2	21267	4.6	5.5	3.2	23147	4.6
Gross Domestic Product	32111	3.5	2.5	34064	4.1	3.7	2.8	36296	4.2
Net Factor Income	-3415	3.1	2.3	-3601	-0.5	3.7	2.6	-3835	-0.6
Gross National Product	28696	3.6	2.5	30462	3.6	3.7	2.8	32461	3.7

**TABLE A.4: National Income and National Product
Current Prices, £ Million**

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Agricultural Incomes	1605	1878	1962	1855	1706	1704	1699	1705	1712	1715
Non-Ag. Wage Income	10488	10982	11709	12558	13343	14327	15479	16456	17528	18750
Non-Ag. Profits Net	4732	5312	5973	7055	6885	7305	7967	8328	8831	9437
Non-Ag. Profits Gross	4834	5372	6135	6775	7015	7523	8176	8526	9029	9641
Stock Appreciation adj. (-)	102	60	162	-280	130	218	209	198	198	204
Financial Services adj. (-)	884	968	1058	1100	1170	1270	1396	1495	1610	1745
Domestic Income	15939	17204	18586	20368	20764	22065	23749	24993	26460	28157
Depreciation	1994	2129	2336	2558	2699	2878	3070	3269	3467	3684
GDP (Factor Cost)	17933	19333	20922	22926	23463	24944	26819	28263	29928	31841
Taxes on Expenditure	3672	3965	4368	4450	4588	4767	5027	5299	5612	5961
Domestic	3344	3672	4050	4151	4273	4439	4688	4950	5254	5592
EC	329	293	318	299	315	327	339	349	359	369
Subsidies (-)	1564	1814	1372	1830	1450	1400	1427	1450	1477	1506
Domestic	766	910	380	550	430	575	594	609	627	648
EC	799	905	992	1280	1020	825	833	842	850	858
GDP (Market Prices)	20041	21484	23918	25546	26601	28310	30419	32111	34064	36296
Net Factor Income	-1957	-2542	-3039	-2878	-2942	-3062	-3253	-3415	-3601	-3835
Gross National Product	18084	18942	20879	22668	23659	25248	27166	28696	30462	32461

**TABLE A.5: Public Authorities' Accounts
Current Prices, £ Million**

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Taxes on Income and Wealth	4275	4821	4659	5161	5490	5805	6111	6483	6823	7230
Company	277	358	359	559	615	637	683	742	774	820
Personal	3998	4463	4300	4602	4875	5168	5428	5741	6049	6411
Taxes on Expenditure	3344	3672	4050	4151	4273	4439	4688	4950	5254	5592
Gross	3574	3949	4340	4432	4590	4769	5029	5301	5615	5963
EC Budget Contribution (-)	231	277	290	281	317	330	341	351	361	371
Net Trading & Inv. Income	481	470	368	436	490	450	465	475	487	501
Transfers From Abroad	237	181	180	161	360	320	340	350	360	370
Total Current Receipts	8337	9144	9257	9909	10613	11014	11604	12259	12924	13693
Subsidies	766	910	380	550	430	575	594	609	627	648
National Debt Interest	1944	2015	2032	2169	2220	2187	2256	2333	2413	2498
Other Transfer Payments	3421	3551	3555	3705	3998	4153	4309	4484	4657	4834
Public Consumption	3577	3595	3683	4010	4396	4740	5117	5408	5724	6083
Total Current Expenditure	9707	10071	9650	10434	11044	11656	12276	12833	13420	14063
Public Auth. Savings (net)	-1369	-927	-393	-525	-431	-642	-672	-574	-496	-371
as % of GNP	-7.6	-4.9	-1.9	-2.3	-1.8	-2.5	-2.5	-2.0	-1.6	-1.1
Total Capital Receipts	489	672	504	573	924	806	921	942	966	993
Total Capital Expenditure	1305	1049	749	893	1150	1083	1146	1176	1217	1260
Capital Deficit	-815	-378	-245	-320	-226	-277	-225	-234	-251	-267
Total Borrowing	-2185	-1304	-639	-845	-657	-919	-898	-808	-747	-638
as % of GNP	-12.1	-6.9	-3.1	-3.7	-2.8	-3.6	-3.3	-2.8	-2.5	-2.0

TABLE A.6: Balance of Payments
Current Prices, £ Million

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Exports - Total	11785	13533	15990	15915	16629	18496	20314	22059	23937	26045
Merchandise	10447	12073	14440	14192	14785	16552	18253	19872	21606	23555
Services	1338	1460	1550	1723	1843	1943	2061	2187	2332	2490
Imports - Total	11530	11981	13285	14030	14654	15581	16723	17569	18535	19548
Balance of Trade	1317	1968	2302	2010	1844	2235	2294	2524	2670	2898
as % of GNP	7.3	10.4	11.0	8.9	7.8	8.9	8.4	8.8	8.8	8.9
International Transfers										
EC Subsidies	799	905	992	1280	1020	825	833	842	850	858
EC Taxes (-)	329	293	318	299	315	327	339	349	359	369
Capital	-13	62	72	195	320	344	450	463	476	490
Government Payments (-)	52	76	56	60	110	113	116	119	123	127
Government Receipts	237	181	180	161	360	320	340	350	360	370
Private Transfers	236	233	238	258	270	281	290	299	307	316
Net International Transfers	879	1011	1108	1535	1545	1330	1459	1485	1512	1539
Factor Income Flows	-1957	-2542	-3039	-2878	-2942	-3062	-3253	-3415	-3601	-3835
National Debt Interest (-)	804	894	973	1024	1075	1039	1065	1096	1125	1155
Profits etc. Outflows (-)	1307	1908	2337	2150	2193	2442	2673	2867	3087	3355
Other Factor income	154	260	271	296	326	419	485	548	610	674
Current Account Balance	239	437	371	667	447	502	500	595	581	601
as % of GNP	1.3	2.3	1.8	2.9	1.9	2.0	1.8	2.1	1.9	1.9

TABLE A.7: Public Authorities' Debt Financing
Current Prices, £ Million

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Budgetary definitions										
Exchequer Borrowing	-1786	-619	-479	-462	-460	-723	-706	-621	-565	-463
as % of GNP	-9.9	-3.3	-2.3	-2.0	-1.9	-2.9	-2.6	-2.2	-1.86	-1.43
Current Budget Deficit	-1180	-317	-263	-152	-295	-507	-541	-448	-375	-256
as % of GNP	-6.5	-1.7	-1.3	-0.7	-1.3	-2.0	-2.0	-1.6	-1.23	-0.79
CHANGE IN:										
Govt. Securities Held by:										
Commercial Banks		-2563	-203	119	0	161	197	161	178	201
Central Bank		-13	13	1	0	0	0	0	0	0
Non-Bank Private Sector		1535	-195	152	178	212	197	187	164	141
Total (Domestically held)		-1040	-385	272	178	373	394	347	342	342
Small Savings		422	216	253	187	223	208	196	173	148
Other Borr. from C.Bank		-171	-270	164	0	-55	-67	-54	-62	-71
Total Domestic Debt		-789	-439	689	365	541	534	490	453	419
Foreign Debt:										
Government Securities		865	1002	36	197	0	0	0	0	0
Foreign Currency Debt		-194	-331	-316	-266	472	461	407	371	288
Total Foreign		671	671	-280	-69	472	461	407	371	288
Total Debt		-119	232	409	296	1013	995	897	824	706
Total £IR Debt		76	563	725	562	541	534	490	453	419
Government Foreign Borrowing:										
In Foreign currencies	405	-282	-50	-44	-200	378	363	319	294	219
In Government Securities	460	867	1320	5	0	0	0	0	0	0
Total	865	585	1270	-39	-200	378	363	319	294	219

**TABLE A.8: National Debt
Current Prices, £ Million**

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Government Securities Held by:										
Commercial Banks	5381	2819	2616	2735	2735	2896	3093	3254	3432	3633
Central Bank	365	352	365	365	365	365	365	365	365	365
Private Non-Bank	5830	7365	7170	7322	7500	7712	7909	8096	8260	8401
Total Domestic	11576	10536	10151	10423	10601	10973	11368	11715	12057	12399
Foreigners	1800	2665	3667	3703	3900	3900	3900	3900	3900	3900
Total	13376	13201	13818	14126	14501	14873	15268	15615	15957	16299
Other Borrowing from C.Bank	-572	-743	-1013	-849	-849	-904	-971	-1025	-1087	-1158
Small Savings	2323	2745	2960	3213	3400	3623	3830	4027	4200	4348
Total Debt Held Domestically	13327	12538	12098	12787	13152	13693	14227	14717	15169	15588
Total £Ir Debt	15127	15203	15765	16490	17052	17593	18127	18617	19069	19488
Foreign Debt:										
Foreign Currency	9693	9498	9168	8852	8587	9059	9520	9927	10298	10586
Government Securities	1800	2665	3667	3703	3900	3900	3900	3900	3900	3900
Total Foreign Debt	11493	12164	12835	12555	12487	12959	13420	13827	14198	14486
Total National Debt	24820	24701	24933	25342	25638	26651	27647	28543	29367	30074
Debt Ratios (% of GNP)										
Total National Debt	137.2	130.4	119.4	111.8	108.4	105.6	101.8	99.5	96.4	92.6
Total Domestic Debt	73.7	66.2	57.9	56.4	55.6	54.2	52.4	51.3	49.8	48.0
Total Foreign Debt	63.6	64.2	61.5	55.4	52.8	51.3	49.4	48.2	46.6	44.6
Total £Ir Debt	83.6	80.3	75.5	72.7	72.1	69.7	66.7	64.9	62.6	60.0
Total Foreign Currency Debt	53.6	50.1	43.9	39.1	36.3	35.9	35.0	34.6	33.8	32.6

THE ESRI MEDIUM-TERM ECONOMIC MODEL¹

John Bradley and John Fitz Gerald

1 INTRODUCTION

Of the many reasons that could be advanced for constructing a computer model of the economy, the least convincing is the quest for a kind of crystal ball with which to forecast the future. Any notion that the ESRI model contains within itself the seeds of Ireland's future is totally misguided for at least two reasons.

Firstly, given the supporting set of assumptions about the future world economy and domestic policy actions, almost any outturn can be generated by the model. Since the model is totally silent in the choice of these assumptions, a major underlying support of any forecast must seek its justification elsewhere.

Secondly, just as generals always fight the present war based on experience from the last, so also do models incorporate the assumption that the economy of the future will function very much like the economy did in the recent past (meaning 15 to 20 years).

What then is the justification for devoting scarce resources towards constructing and maintaining a large-scale computer model of the Irish economy, the latter often being the more expensive aspect? Where do the ideas for the model structure and properties originate? Does the model tell us anything worth knowing that any competent economic analyst could not work out from reading the international forecasting and analysis literature and manipulating data on a simple spreadsheet?

Taking the last issue first, to some extent the production of short-term forecasts (with a 12-15 month time horizon) can be produced with a simpler judgemental-based technology and is an activity that is complementary to the analysis of the medium-term (3-5 years), and not a substitute for it. Indeed, a formal macromodel may not be always appropriate for the task of short-term forecasting.

Most of the economic forecasting reported regularly in the media is of the short-term variety. Attention is focussed on the demand-side of the economy, and on the incomes generated by expenditures on consumption, investment, trade, etc. The nature and capacity of production is regarded as fixed, the short-term issue being the rate of capacity utilisation. Attention to public policy tends to focus on the immediately preceding and/or anticipated budget.

When one moves into the future, the situation becomes more complicated. Investment activities can change the productive capacity of the economy; some sectors may decline, others may grow; policy changes which have only minor short-term implications can have major long-term consequences. In short, everything begins to become interdependent, and the ultimate consequences of policy or other shocks becomes difficult to disentangle using judgemental or *ad-hoc* methods.

If, in the medium-term, judgemental methods must be augmented by more formal approaches, where do the ideas for the formal models come from? How valid are they? Could a formal model be seriously in error?

Ever since data on the economy became widely available (an important by-product of the development of Keynesian macroeconomics in the 1930s and 1940s), economists have attempted to test their theories by constructing formal quantitative models (i.e., models that tell you the *magnitude* as well as the *direction* of any given result). The early models displayed their Keynesian origins in their focus on the demand side of the economy with little attention paid to the supply side.

However, as the world changed in ways that were not anticipated by Keynesian economists, ideas and theories of how the economy functioned also changed, albeit with a delay. For example, during the 1970s the world economy was hit by a series of massive supply-side shocks (energy shortages, oil and other commodity price rises), which opened up serious weaknesses in the demand-side underpinnings of most operational economic models then being used. For a time modelling went out of fashion, since it provided a poor guideline on how to grapple with a supply-side recession (referred to popularly as *stagflation*; low growth combined with high inflation).

The late 1970s and the 1980s saw the emergence of conflicting viewpoints and theories of how economies work, always the sign of a discipline vigorously alive. Three main schools emerged:

- (a) *The New Classical School*: These economists hold that, contrary to the old Keynesian assumptions, markets do clear very quickly and that people form their expectations rationally, i.e., using all available information. They provide little or no role for public policy in boosting output or reducing unemployment, even in the short term.

¹ The ESRI Medium-Term Model was developed in part within an EC-wide modelling exercise (HERMES) within DG XII (Science, Research and Development), and has also been funded by a research contract with DG XVI (Regional Funds). Over the years the project has benefited greatly from collaboration with colleagues in the Irish Department of Finance, the Central Bank of Ireland, University College Cork, University College Dublin, Trinity College, and DG II (Economics and Finance).

- (b) *The Monetarist School*: These economists believe that while the economy has a natural tendency to move towards equilibrium, this can take a long time since prices and wages only adjust very slowly. They believe that only inflation results from government boosts to demand, and that no attempt should be made to "fine-tune" the economy using discretionary policy actions. Rather, stable and robust policy rules should be adhered to.
- (c) *The New Keynesian School*: This is the lineal descendant of the original Keynesian economics of price rigidity and non-clearing markets, updated with a more sophisticated modelling of expectations, wage-price rigidity and supply-side responses. It holds that although markets may clear in the very long-run, there is at least some role for public counter-cyclical policy.

It is from the latter New Keynesian school that the ESRI medium-term model draws its inspiration, building on the earlier Keynesian model developed in the Central Bank and the Department of Finance in the 1970s,² and incorporating much new research on the production side of the economy. An application of an early four-sector version of the ESRI model to a study of the fiscal expansions of the 1970s found that no permanent benefit to the economy resulted.³ A subsequent updated version was used in the *Medium-Term Reviews*, covering the periods 1987-92 and 1989-94.⁴ A full technical description of that first version is available in an ESRI publication.⁵

The purpose of this short article is to provide a non-technical introduction to the present revised and extended version of the ESRI medium-term model. While a complete technical description is in preparation, and will be published later in the year, we felt that an informal presentation of the model would assist the reader in following the forecasting and analysis contained earlier in the present *Review*.

In Section 1.2 we give an overview of the key mechanisms in the model, and follow in Sections 1.3 - 1.7 with more detailed descriptions of the main sub-sectors: manufacturing, services, and the public sector, and of the labour supply and the expenditure (or absorption) sides of the model. We conclude with an impression of how we think the model provides a guide to the future evolution of the economy and how it helps present starkly some central policy dilemmas.

2 AN OVERVIEW OF THE MODEL

Economists have three different but ways of looking at the behaviour of the economy. They examine what is produced (for example, output from the industrial sector); what is spent (e.g., private consumption, investment, etc.); and the incomes earned by the factors of production (e.g., the industrial wage bill, profits, etc.).

Each approach (output, expenditure and income), should lead to an identical measure of gross domestic product (GDP), being the conventional aggregate measure of activity in the entire economy. Short-term forecasts (such as published regularly in the ESRI's *Quarterly Economic Commentary*) focus on expenditure-income relations. With a medium-term orientation in mind, the ESRI model focuses initially on the output (or production) relationships, and examines the downstream expenditure and income consequences. The key mechanisms within the model are shown in the box below.

Core Mechanisms in the ESRI Model

- (1) The exposed sector is driven by world demand, elements of domestic demand, and cost competitiveness.
- (2) The sheltered market sector (services and building) is driven by domestic demand.
- (3) The public sector is policy-driven, with borrowing and debt accumulation modelled.
- (4) Wages are determined in a bargaining model, and influenced by prices, taxes, unemployment and productivity.
- (5) The labour market is open and influenced by conditions in the UK labour market.

Production in the Model

An initial distinction can be made between those sectors of the economy that are exposed to the world trading environment (the traded sector) and those sectors that are sheltered from *direct* exposure to trade (the non-traded sector). Broadly speaking, the traded sectors consist of manufacturing, most of agriculture,⁶ and a small part of market services. The non-traded sectors comprise the rest (i.e., utilities, building services, most of market services and all public or non-market services). The relative sizes of these sectors, in terms of added-value, are shown in **Figure 1**.

2 J. Bradley, C. McCarthy and T. O'Connell, 1978: "The Central Bank's Macroeconomic Model: Structure, Estimation and Application", Central Bank of Ireland, Winter Bulletin; J. Fitz Gerald and O. Keegan, "The Behavioural Characteristics of the MODEL-80 Model of the Irish Economy", *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXIV.

3 J. Bradley, C. Fanning, C. Prendergast and M. Wynne, 1985: *Medium-term Analysis of Fiscal Policy in Ireland: A Macroeconometric Study of the Period 1967-1980*, Dublin: Economic & Social Research Institute

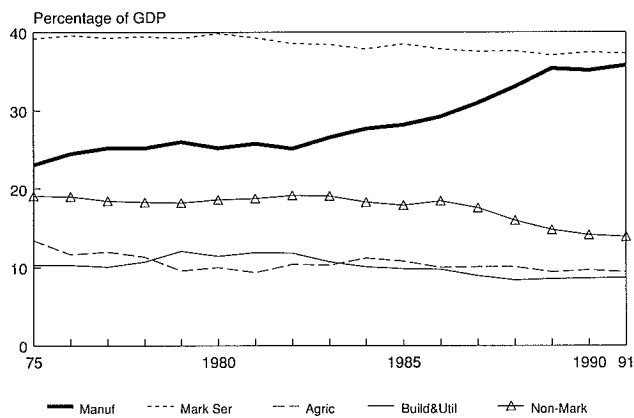
4 J. Bradley, J. Fitz Gerald and A. Storey, 1987: *Medium-Term Review: 1987-1992*; J. Bradley and J. Fitz Gerald, 1989: *Medium-Term Review: 1989-1994*, Economic and Social Research Institute.

5 J. Bradley, J. Fitz Gerald, D. Hurley, L. O'Sullivan and A. Storey, 1989: *HERMES-Ireland: A Model of the Irish Economy: Structure and Performance*, Dublin: Economic and Social Research Institute.

6 Some details of the agriculture sector is given in the special article on the CAP in this *Review*.

Given the extreme openness of the Irish economy (the total of imports and exports was 133 percent of GNP in 1991), we give primacy to the traded sector as the main engine of sustainable growth. In the case of manufacturing, there are two key determinants of growth: the state of world⁷ demand and the level of Irish cost competitiveness relative to its trading partners.⁸ Hence, the two external forces driving the Irish manufacturing sector's output are the rate of world growth (which is more-or-less-transmitted one-for-one to Ireland) and the level of world cost competitiveness, which Ireland must at least match in order to grow as fast as the world economy. Any gain in competitiveness results in an increase in market share and growth faster than the world economy. Any loss of competitiveness reverses this process.

FIGURE 1
Sectoral Output Shares of GDP



Given the level of output in manufacturing, the manner in which it is produced is then determined. Firstly, arising as a consequence of its exposure to world competitive forces, Irish manufacturing output prices are determined in the world market place and cannot easily be altered to respond to Irish cost conditions. The appropriate mix of labour, capital and material inputs depends on their relative prices. For example, if wage inflation outstrips rises in the cost of capital, there is some scope for substituting capital for labour in the medium-term production process. In addition to relative price terms, there is also a systematic trend in the use of some factor inputs due to "technical progress". For example, in manufacturing there is a tendency towards "labour saving technical progress", i.e., some 3 percent less labour is needed per annum to produce the same level of real output.

Developing on the above outline, the ESRI model contains equations describing the determination of manufacturing output and factor inputs, in terms of external forces (world output and world competitiveness) and domestic forces (mainly Irish wage costs, with some role for domestic demand). Since output prices and the prices of material inputs and capital are largely determined externally, attention is focussed on the determination of wage rates, to which we now turn.

The algebra of the wage bargaining equation is outlined in the box. Industrial wage rates are modelled as the outcome of bargaining between trades unions and employers, with the frequent intervention of the government. In such models, wages are determined by at least four explanatory variables: output prices, the "wedge" driven by taxes between the wage denominated in the employer's (output) price and the take home consumption wage enjoyed by workers; the rate of unemployment; and labour productivity.

The Simple Economics of Wage Bargaining

Consider the formula for the share of the value of output going to fund the wage bill;

$$\frac{L*W}{Q*P} = k$$

where L is the number employed, Q the volume of output, P the price of output and W the wage rate. Suppose that the share, k, is not constant, but is influenced by the unemployment rate and a measure of taxation (the tax "wedge"). Rewriting the equation in log form yields

$$\log\left(\frac{W}{P}\right) = a_1 + a_2 \text{Log}(wedge) + a_3 UR + a_4 \log(prod)$$

where prod = Q/L represents labour productivity and UR is the rate of unemployment. A dynamic version of this equation is used to determine wage rates in aggregate industry in the ESRI model. All other sectoral wage rates are linked to the central industry wage bargain.

Empirical evidence shows that the following is the effect of wages (treated in isolation from the rest of the model) of a specified change in each of the "explanatory" variables:

1 % rise in price (P)	1 % rise in wages
1 % rise in wedge	0.40 rise in wages
1 % point rise in UR	1.6 % fall in wages
1 % rise in prod	0.60 % rise in wages

In the longer term the above affects are magnified by a factor of 1.7, although it is not very meaningful to isolate the wage equation from the model in such circumstances.

The price that the employer obtains for her product clearly influences the price at which she can profitably purchase factor inputs, like labour. The "wedge" effect arises as workers try to bargain in terms of a take-home wage denominated in consumer prices and not in terms of the gross pre-tax wage. The effect of unemployment on wages is called by economists the "Phillips curve"; it basically states that the tighter the labour market, the higher will be wage settlements, and *vice versa*. Finally, the productivity effect comes as workers try to participate in the benefits of real growth. The data from the past few decades showed that there tended to be a total pass-through of productivity gains on average (controlling for all other factors). Any tendency for the

⁷ We use the term "world" somewhat loosely in this article, where a more correct usage would consist of a trade-weighted measure of activity in a range of countries in Ireland's trading sphere.

⁸ In some subsectors, we shall see that the state of domestic demand also plays a role, but one which is subsidiary to world demand.

pass-through to fall below unity will lower labour's share of the value of output (and correspondingly raise the profit share).

Turning now to the non-traded sector, consider the behaviour of the large market services sector. Leaving aside tourism and other traded services (a relatively small fraction of the total), output in market services is driven by domestic demand. So, for example, private consumption will contain a certain element of services output (transport and communication, recreation, professional services), and any change in consumption will impact on the demand for services output accordingly.

Services output is assumed to be produced in a way that attempts to minimise costs of production. Hence the mix of capital and labour inputs is sensitive to the relative prices of the inputs, as in manufacturing. However, given its high degree of insulation from world competition, prices in the services sector tend to be determined as a mark-up on input costs. Hence, if these services are required as inputs into manufacturing, a loss in industrial competitiveness can result if Irish services prices rise excessively.

It is the balance between the traded and the non-traded sectors that makes the Irish economy (and, consequently its modelling) interesting and more complex than the highly stylized "small open economy" model that is developed in economics textbooks. Indeed, as we shall see below, the export-oriented development of the Irish manufacturing sector through multinational foreign direct investment makes the Irish economy quite unique among the EC peripheral members.

3 THE MANUFACTURING SECTOR

The first version of the ESRI model contained an aggregate industrial sector, comprising manufacturing, utilities and building. Experience with that model pointed to the need to disaggregate the sector into five subsectors: a separate treatment of utilities and of building, and a three-way breakdown of manufacturing.

Examination of manufacturing illustrated that there were three quite separate components in terms of how the subsectors functioned. First, a *high-technology* sector could be identified, which was largely foreign owned, almost 100 percent export oriented, capital and R&D intensive, and which had a high propensity to repatriate its profits out of Ireland. Second, the *food processing* sector had a unique dependence on domestic agricultural production (mainly of cattle and milk), and fell under the influence of the EC Common Agriculture Policy (CAP), with its price and quota rules. Finally, the *traditional manufacturing* sector covering a diverse area of drink, textiles, clothing, wood, paper, publishing, etc., was mainly in domestic ownership, tended to be more labour intensive than the other sectors, and was less export oriented (but still traded over 50 percent of its output).

The three sectors differ in terms of their driving forces. The high-technology sector is driven by world demand (with no domestic demand influence) and competitiveness. Output in the food processing sector is constrained by Irish agricultural production within the CAP. In the traditional sector, both world and domestic demand play a role, together with international competitiveness.

The factor inputs were modelled in a way that recognized that the capital stock could only be varied slowly over time, whereas the other inputs (labour, energy and other materials) could be varied more rapidly in response to changes in relative prices. A full technical description of the findings concerning the underlying technologies of the three sectors is available.⁹ Briefly, it was found that the possibilities of substituting the different factor inputs (labour, capital, materials) were more restricted than might apply in a larger, less open, economy such as the USA, Germany or the UK. In the case of the high-technology sector, the low possibilities of factor substitution *within Ireland* are in stark contrast to the greater possibilities of relocating the entire production process out of Ireland, if competitiveness is lost.

4 THE MARKET SERVICES SECTOR

The first version of the ESRI model contained an aggregate market services sector based on the very limited data available at the time from the CSO. The very heterogenous nature of the sector made the construction of an aggregate model very difficult to justify, and the *ad hoc* model lacked any firm foundation in economic theory.

The advent of 1992 made it imperative to understand the behaviour of the market services sector, since this sector was likely to bear some of the burdens of rationalisation within the single European market (e.g., rationalisation of distribution and opening up of financial markets).

In the present version of the ESRI model we treat market services in a three-way split: distribution (wholesale and retail), transport and communications, and other (professional, financial, personal) services. In each case, the scale of output is determined in the model by a suitably weighted measure of final demand (e.g., the weights determining, say, distribution output reflect the distribution content of consumption, etc.).

The special nature of the transport and communications sector is recognized in the model, where the capital stock varies very slowly over time and is subject to public sector influences (e.g., the massive investment in telecommunications during the first half of the 1980s). However, in the other two sectors the mix of capital and labour is sensitive to factor prices. In addition, "technical progress" was found to be labour saving in distribution but labour using in other services (i.e., over time output becomes *less* labour intensive in

9 J. Bradley, J. Fitz Gerald and I. Kearney, 1990: "Modelling Manufacturing Sector Behaviour Using a Restricted Cost Function: Open Economy Extensions", Report submitted to DG XVI, Economic and Social Research Institute.

distribution but *more* labour intensive in other services). A full technical description of the market services sector is available.¹⁰

5 THE SUPPLY OF LABOUR

The demand for labour is determined in the production block of the model, as a derived demand, and is influenced by the scale of output, prices (including the wage rate), and trend terms capturing technical progress. The supply of labour consists of a series of relationships determining population of working age, participation in full-time education, participation in the labour force, and migration.

Starting with population, the population of working age (15-64 years) grows at a "natural" rate (that can shift over time due to underlying changes in fertility, etc), but is sensitive to migration flows into and out of the country.

A certain proportion of those of working age will decide to participate in full-time education. Another proportion of those remaining will decide to participate in the labour force and seek work. This labour force participation ratio is determined by such factors as the probability of obtaining work (proxied by the employment rate, or one minus the unemployment rate); the returns to employment (proxied by the "replacement ratio, or the fraction of average annual earnings made up by income transfer payments); and slowly changing sociological factors (proxied by time).

The final chain in the determination of labour supply is migration. Net outwards migration is determined by the relative attractiveness of the nearest alternative labour market, the United Kingdom. If the probability of obtaining work in Ireland disimproves (equivalently, if the Irish rate of unemployment rises relative to the UK), there will be a tendency for outflows of migrants to start up or accelerate. In addition, if the returns to working in Ireland deteriorate relative to the UK (measured in terms of relative real after tax earnings), a further tendency to outmigration will be created.

The migration mechanism is one of the more crucial relationships in the model and, it must be admitted, one of the less reliable in terms of robustness of the statistical estimates. To ignore the possibility of migration (i.e., to assume that the Irish labour market is "closed") would be to commit a serious error, leading to an overestimate of the forces operating between higher unemployment and wages in the Phillips curve (see above), driving down wages and pricing labour back into jobs. However, too high a model sensitivity of migration outflows to any deterioration in the Irish labour market leads to a serious underestimate of the equilibrating powers of higher unemployment on wages. On balance, we feel that the long-run migration relation is adequately captured in the model, but the timing of short-run responses may not be handled adequately by our approach.

6 THE PUBLIC SECTOR

Although we could attempt to explain public sector behaviour in terms of implicit or explicit objectives a society may set itself, most conventional economy-wide models take the key decisions of the public sector as determined by forces not included within the model. So, for example, public sector employment numbers, tax rates and rates of income support are taken as given and are not derived within the model as arising from the desire to achieve some other objective. Of course, one may manipulate such policy instruments in order to achieve different outturns, but the policy settings (public employment, tax rates, etc.) are not on "auto-pilot" and can be changed arbitrarily by the "policy maker", within the bounds of political and financial feasibility.

The output measure of public sector activity is essentially determined by public employment inputs, and appears in the model on the expenditure side of the national accounts as public consumption. Financing public consumption represents ultimately a burden on the rest of the economy (a burden that can only be delayed by debt rather than tax financing).

A wider measure of the size of the public sector in the economy consists of total public expenditure, obtained by adding public consumption, subsidies, current and capital transfers (such as unemployment benefits and IDA grants to industry), national debt interest payments, and public investment expenditures (such as housing, roads, etc). These additional expenditure items are also included in the ESRI model as the product of some notional "rate" applied to a notional "base" (e.g., expenditure of unemployment transfers is determined as the product of an average rate of transfer - a policy instrument - multiplied by the numbers unemployed (determined elsewhere in the model). The main tax revenues are similarly determined as the product of a tax "rate" by a "tax base" (e.g., VAT receipts are the product of an average VAT rate - a policy instrument - by the VAT base, being essentially the value of consumption).

The exchequer surplus is the difference between tax and other revenue and current expenditure. While theoretically any expanded level of public expenditure could be financed by raising taxes and keeping the exchequer borrowing requirement roughly in balance, in fact resort was made both to tax financing and to borrowing during the 1970s and 1980s. Financing the burgeoning EBR required the state to borrow both domestically and abroad, and to accumulate a national debt. Domestic borrowing is set in the model as a proportion of domestic savings, and the residual deficit is financed by foreign borrowing. A useful measure of the debt-servicing capacity of a nation is the accumulated national debt as a proportion of GNP (the "debt/GNP" ratio), a variable also determined within the model.

7 EXPENDITURE

The expenditure side of the national accounts consists of private and public consumption and investment, stock changes, exports and imports. Certain key elements of expenditure in the ESRI model should be emphasised.

The quest for a stable and robust model of private consumption behaviour has taxed, and continues to tax, the brains of economic modellers both in Ireland and abroad (see Whelan, 1991 for a recent contribution to the intellectual debate). Our approach has been to use the very simplest model where consumers are assumed to be liquidity constrained. This implies that consumption is determined by current personal disposable income, excluding any wealth effects. Pending improvement in this area, we interfere with the model's consumption forecasts if the more recent data indicates a change of behaviour (refer Chapters 2 and 4 above).

Private investment is determined on the supply side of the model, described above, as a derived factor demand into the production process.¹¹ So, investment is determined initially by sector, and the aggregate sectoral investment is split between its two main components: machinery and equipment, and building and construction.

The public elements of consumption and investment are used as policy instruments in the model.

Industrial exports are determined in a supply function in terms of sectoral manufacturing output, where the marginal propensities to export the output of each sector are estimated, and corrected by a time-trend, permitting the export share of output to rise over time.

Finally, there is no conventional demand for imports equation in our model. Rather, we determine all the separate sectoral components of output, and all the elements of final demand. Imports are determined as a "residual", i.e., as the difference between output and final demand.

If Ireland faced a binding balance of payments constraint (like many third world countries), the ability to import would be constrained by the ability to finance the balance of payments deficit. In practice our approach simply imposes consistency between domestic supply (determined in the production block) and domestic demand (determined in the absorption block).

8 THE MODEL AS GUIDE TO THE FUTURE

Economic models are used in two different but related situations: forecasting and policy analysis. If one requires simply to forecast aggregate Irish GNP forward a few years, a simple approach based on extrapolating recent past GNP trends, adjusted by a study of likely future world trends, and applied with a dash of common sense will probably out-guess any large structural economic model! However, if a series of detailed sectoral forecasts, based on a range of different world scenarios and domestic policy stances, is required, the simple isolated time-series approach becomes less relevant.

In such a situation, a large-scale structural model has its own set of problems. For example, the so-called "Lucas critique" (after the US economist of the New Classical school, Robert Lucas) holds that model-based policy analysis is invalid since the model's structural parameters (the numbers obtained from statistical analysis of past data) cannot be assumed to remain unchanged in the face of policy regime shifts.

However, it is generally accepted that the force of the Lucas critique is greatest in the case of "reduced form" models, i.e., small-scale models whose equations represent a mixture of behavioural, policy reaction and *ad hoc* elements. Nevertheless, even for structural models, care must be taken to ensure that one does not stray into configurations of the economy which are very different to those which characterised the years used for model calibration.

Another aspect of modelling concerns the formation of expectations. Most conventional models (including our own) use adaptive or extrapolative expectations mechanisms, which basically say that future performance of a particular variable is affected only by its past.

A more recent development uses "rational" expectations mechanisms, which assume that people form their view of the future by taking account of all available information, including available economic model forecasts. So, for example, when it became accepted in 1986/87 that the Central Bank and the government were firmly committed to maintaining the Irish pound - Deutschmark link, rational expectations would require the complete discounting of any past experience and quick adjustment to the new credible exchange rate regime. Incorporation of forward-looking expectations into a model is technically very complex and is on the future research agenda for the ESRI model.

What then can we realistically demand from the ESRI medium-term model? Firstly, it can be used to develop medium-term forecasts, conditional on judgemental assumptions concerning the world economy and domestic policy. Such forecasts are never used in "pure" form, and are altered *post hoc* in the light of judgement and experience. Nevertheless, the model provides an essential accounting and economic framework within which to formulate and evaluate forecasts. While the absence of such a framework makes realistic medium-term forecasting difficult, if not impossible, to carry out, its presence is still no absolute guarantee of the validity of the forecast.

Secondly, a limited form of policy and scenario analysis can be carried out using the model. Examples of this analysis are included in the previous chapters of this *Review*. Ideally, such scenarios should not differ massively from the historical inputs. In practice one pushes the model to its limits and beyond, and must adjust ones evaluation of the validity of the results accordingly. If this is living dangerously, what then is the situation where no model is available and one must be guided by "irrelevancies in the past, hunches as to the present and clairvoyance as to the future"?

¹¹ Private housing investment is determined separately as a function of real disposable income, and the real cost of borrowing.

ECONOMIC CONSEQUENCES OF CAP REFORM*

by John Fitz Gerald and Deirdre O'Connor

1 INTRODUCTION

Attempts at reform of the Common Agricultural Policy (CAP) are almost as old as the CAP itself. Beginning with the Mansholt plan of 1968 there have been many crises and partial *reforms* in the intervening years. The most recent major change was the introduction in February 1988 of the financial framework which effectively set a "ceiling" on CAP spending for the period 1988 to 1992. This was accompanied by the imposition of budgetary stabilisers for agricultural commodity programmes designed to prevent over-production and keep them within budgetary targets.

While the immediate cause of the latest crisis is the escalation in CAP spending, which this year threatens to exceed the above-mentioned ceiling of ECU 32.5bn. set in 1988, there are other deeper factors. The unification of Germany and developments in Eastern Europe have been contributory factors in the emerging budgetary crisis. However, even without these changes the CAP faced major problems in the early 1990s.

Not least of these is the pressure within the GATT round to move towards freer world trade in agriculture. However, the pressures for reform should not be seen as merely political pressures from outside the EC, in particular from the US. The CAP itself is manifestly inefficient in terms of its objective of supporting farm incomes and in the size of the surpluses which it generates. There is increasing awareness of the skewed distribution of the benefits from the CAP, whereby, according to the EC Commission, 80% of support goes to the 20% of farmers who produce 80% of the output. This is the consequence of attempting to support farm incomes using a price policy. Attention has also been drawn to the build up of food stocks which are currently worth ECU 3.7bn. This results from the gap between growth in agricultural production and consumption in the EC. These grew by 2% and 0.5% respectively between 1973 and 1988.

While it could be argued that the CAP may benefit food-importing Third World countries by depressing world prices for some commodities, there is little doubt that it causes major problems for those which are food-exporting. In addition, the need to assist Eastern European countries in developing their economies will

put increasing pressure on the EC to agree to greatly improved access for Hungarian and Polish farm produce. In the longer term the broadening of the EC's membership seems highly likely. Thus the pressures for changes in the CAP in the 1990s are emanating from a number of different sources and they will clearly have to be faced up to in the coming five years.

While the problems with the CAP are reasonably obvious, the path for future reform is by no means clear. The conflicting interests of farmers and non-farmers, of farmers in different member states of the EC, and of the EC and other trading groups means that the path for reform is a highly politicised issue.

The EC faces a choice of moving towards freer trade in agriculture or, on the other hand, adopting a *fortress Europe* approach by attempting to reduce EC production to self-sufficiency levels by means of quota restrictions. These two polar cases would have very different implications for Irish agriculture. They would both involve very substantial costs for the farming community, costs which one might hope would be made good from the EC budget.

The choice between these polar cases could also give rise to a conflict of interest between the farming and food processing sectors. A regime whereby production is restricted by means of quotas is more attractive to farmers than it is to food processors. From the point of view of food processors, lower prices and a higher volume of output is preferable. There is no obvious or *correct* solution. A spectrum of possible alternative policies lies between these two polar cases.

The ultimate impact of any reform package on Ireland cannot be evaluated completely without reference to a number of other factors. These include the response of other European producers to any proposals, the outcome of the current round of GATT negotiations, and the direction which any future CAP reform is likely to take. Given the complexity of this issue, it is important for Ireland to explore where our best interest lies and to develop our own approach to the reform of the CAP.

There are currently three sets of issues relating to agriculture which face the EC; the price review for 1991/1992 which has now been decided, the on-going GATT negotiations and the question of long-term CAP reform. While these three issues are inter-related, the focus of this paper will be on the latter issue, long-term

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reform. To date, no formal proposals have been put forward in this regard. However, the Commission has produced a document indicating the direction which future CAP reform should take. This document, which was widely leaked in February, does not have any official status as it represents only one possible scenario being examined by Commissioner MacSharry. Nevertheless, it does contain specific proposals which we can attempt to quantify and it is for this reason we have chosen to focus on this document.

Our objective is to analyse these proposals in terms of their impact on the domestic economy. We do this by comparing the likely outturn under these proposals with a notional base-line projection where the CAP is assumed to continue unreformed. However, the Commission document makes it clear that continuation of the CAP in its present form is not an option. Section 2 of this paper considers the likely impact of the reform proposals on the Irish agricultural sector, using an appropriate model of that sector's behaviour. Section 3 considers the wider implications for the Irish economy using the ESRI *Medium Term Model*, described elsewhere in this *Review*. The concluding section explores the implications of these results for future Irish policy on the CAP.

2 EFFECTS ON AGRICULTURE

One of the hallmarks of the agricultural sector is the importance of the inter-relationships between supply, demand, price determination, factor inputs and agricultural income (Boyle, 1991, p.4). Rather like squeezing a balloon, when prices for one product are cut farmers react to the squeeze on profitability by switching production to other enterprises. They may also change their volume of inputs. Thus it is not possible to analyse the response of agriculture in Ireland, or the EC, to changes in prices or quotas without a model which takes these complex inter-relationships into account.

Here we use a model, developed, by Boyle, 1991, which is described in separate box. One problem which we face is the absence of a model of the EC agricultural sector. As the full implications for Ireland of any changes in the CAP will depend on how farmers elsewhere react, the absence of such a framework must be taken into account in an *ad hoc* manner.

2.1 Reform Proposals

In this section, we begin by outlining the features of the proposals contained in the above mentioned MacSharry document on CAP reform. We wish to stress again that these are elements of only one option for reform and that what follows is a discussion of some of the principal features of this particular option. There are areas where it is unclear what is being proposed, or how particular proposals would operate in practice. Nevertheless, these proposals would, if implemented, represent the most radical overhaul of the mechanisms of the CAP since its introduction in 1962. They consist of a number of measures which would control production through substantial cuts in price support in conjunction with compensation for income losses. These compensatory payments would be inversely related to the size of the holding, so that smaller producers would receive

proportionately more aid than larger producers. These payments would also, in many cases, be linked to a particular level of stocking density, in a move to encourage less intensive farming in the Community.

In the cereals sector, support prices would be cut by approximately 42%. Compensation would be introduced to make up for lost income but would be graduated according to a producer's current cereal area. The aim of the proposals would be to provide full compensation for all loss incurred up to a production area of 30 hectares. Aid for larger producers would be progressively reduced as shown in Table 7.1 below. In order to obtain these compensatory payments, some farmers would have to agree to set aside, or take out of production, a certain percentage of their cereals growing land. This could then be used for fodder crops, non-food crops or as temporary fallow. The requirements are as shown in the table below.

Table 7.1: Compensation For Cereals

Area of Cereals	< 30 ha.	30 - 80 ha.	> 80 ha.
Compensation Reduction	0%	25%	35%
Set-Aside	0%	25%	35%

On the basis of these percentages, a farmer growing less than 30 hectares of cereals would receive full compensation under this scheme and would not be required to set aside any land. A producer growing 100 hectares would be required to set aside 19.5 hectares and would have aid reduced by the same percentage. Compensatory payments would be boosted by the abolition of the cereals co-responsibility levy. This requires all cereal producers to contribute to the disposal of surplus production once the production target for cereals, which is set in terms of volume, has been exceeded.

In the dairy sector, intervention prices would be cut by 10%, while the global, or Community-wide milk quota would be reduced by 4.5%. Quota reductions for individual operators would not be applied uniformly but would be greater for larger producers. Producers of less than 200,000 kg. annually would not incur any cut in quota while those producing above this level would have quotas cut by 10%. Assuming an annual average yield per cow of 4000 kg. per annum, this would mean that quota cuts would only apply to those producers with a herd size of 50 or more cows. Income losses incurred by small producers would be compensated by a payment of 40 ECU per cow for the first 15 cows. This would be paid on condition that the farmer had a stocking density of not more than 1 livestock unit per forage hectare. Producers would gain additional compensation in the form of the abolition of the milk co-responsibility levy.

In the beef sector, intervention prices would be cut by 15%. In order to provide compensation for income losses, the existing beef premium of 40 ECU/animal for male bovines, currently paid on a once off basis, would be payable annually for a period of three years. This means, over a three year period, a threefold increase in the premium to offset the effect of the price cut. This would only be payable on the first 90 animals, and again on the basis of a stocking density of 1 livestock unit per hectare. In the sheep-meat sector, the aim of the proposals is to encourage less intensive methods of farming

Agriculture Sector Model

The model of the agriculture sector used here is described in Boyle, 1991. The model consists of an integrated system of sub-models:

1. A model determining the volume of total output and the volume of a range of inputs. The volumes are determined as a function of the price of aggregate output, the prices of inputs, and the capital stock (including livestock numbers). Higher output prices increase production. Higher input prices generally reduce it.
2. A model which determines the volume of output of the different agricultural products. The volume of each product is a function of the price of each output and the volume of aggregate output. This effectively allocates total production, determined in the first sub-model, over the range of agricultural products.
3. Separate sub-models can also be used to determine the mix of fertilisers used and the shares of tillage devoted to different crops.

The model was estimated using data for the period 1960-82.

The advantage of using an agricultural sector model for this analysis is that producers' response to the proposals can be captured within the modelling framework and treated in a consistent manner. What this model can show clearly is how producers respond to a change in the price of a commodity - in terms of the extent to which supply changes, the extent to which they attempt to switch into alternative products and the extent to which they change the volume of inputs. Given that some of these alternatives will be subject to constraints on production, e.g., the quota system in the dairy sector, it is essential that our model is capable of handling these restrictions on output.

A number of matters are not dealt with by the model and have to be handled separately. The effects on the capital stock and breeding herd have to be taken into account in an *ad hoc* manner. As with all models, care must be taken when using it to simulate the effects of very large changes in policy.

and to slow down the expansion of flocks. Existing ceilings for payment of the ewe premium would be reduced and linked to eligible ewe numbers in the period 1987 to 1989. Producers would be able to draw an "extensification premium" if they agreed to reduce stocking density. This would act as an income supplement and would be payable in addition to the current ewe premium.

2.2 European Context

The full effects of these changes on Irish agriculture will depend on how farmers throughout the EC react. What ultimately happens to agricultural prices in the Community is crucially dependent on the extent to which the current proposals help to bring about supply balance in the various commodity markets. The amount by which over-supply falls in each market will, to a large extent, determine how far prices can rise from the "floor" of intervention. EC and world prices will also be largely dependent on the outcome of the GATT negotiations.

The cereals sector is the cornerstone of the CAP, in so far as prices in this sector, directly or indirectly determine prices in the livestock sector. It is evident from these proposals that the most severe price cuts occur in the cereals sector. Given its structure in Ireland, with 95% of producers having holdings of less than 30 hectares, and therefore eligible for full compensation, cereal producers in Ireland would appear to fare somewhat better than their counterparts in France or the UK where holdings are much larger. However, the compulsory set-aside requirements, which are a pre-condition for compensation for larger producers, could have a significant impact on cereals output, given that the largest 5% of Irish producers account for 40% of our cereals production. However, in the EC as a whole

the surplus of production over consumption is so great that these changes are unlikely to lead to any movement of market prices above support prices.

Apart from its direct effect on the incomes of cereals producers, the most important effect of these price cuts would be in relation to input prices. It is expected that a 42% cut in cereals prices would reduce the price of feedstuffs by approximately 15%. Because of differences in the composition of feedstuffs in different countries, the fall in input prices will vary across the Community depending on the cereal/non-cereal composition of feedstuffs. This reduction in feed prices would represent a considerable saving for livestock producers, with larger and more intensive producers gaining proportionately more. It has been pointed out that Ireland uses grass in its feed mix to a greater extent, and concentrate feedstuff to a lesser extent, than other countries such as Holland or Denmark. Therefore, it is likely that producers in these countries could see their input prices fall by a greater percentage due to large fall in cereals prices. This effect is likely to be amplified by the larger share of pigmeat and poultry production in these countries' agricultural output.

Another consequence of this fall in cereals prices would be a decrease in the demand for cereal-substitute feedstuffs and a increase in demand for those based on cereals. There may also be some downward pressure on world prices of cereal-substitutes. One possible consequence of lower feedstuff prices would be to increase the attractiveness of more intensive farming methods which would be in direct conflict with the environmental objectives contained in the proposals. This is more likely to apply in the case of dairy producers with the price of milk falling by only 5% while the price of feedstuffs falls by 15%. In the beef sector, cattle prices fall by the same amount as feedstuff prices. However, this development would probably be held in check by the

restrictions on stocking density contained in the reform package and the fact that production in some areas would continue to be constrained.

In the dairy sector, it is estimated that approximately 12% of producers in Ireland have a herd size of over 50 cows and that these producers are responsible for 35% of milk production. Therefore, these producers would be liable to quota cuts of 10%, corresponding to a decrease in milk production of 3.5% at a national level.

In both the dairy and the beef sectors, it is expected that reduced input prices would, to some extent, offset any income losses caused by price or quota cuts. In the case of dairying the reduction in output in the EC may reduce surpluses so that the eventual cut in prices could be less than 10%. However, given that livestock production in Ireland is predominantly grass-based, the reduction in input prices could be relatively smaller than for producers in those countries where production is grain-based.

It is possible that compensatory payments for smaller producers in Ireland in these sectors could be adversely affected by the restrictions contained in the proposals. In many cases, compensatory payments would be conditional on a particular level of stocking density - 1 livestock unit per hectare. It is estimated that this restriction could substantially reduce the number of farmers who are eligible for compensation.

In the sheep-meat sector, we expect that the growth in ewe numbers in the last year could mean that the ewe premium would no longer be payable on approximately one million ewes, a very substantial loss in income for farmers. This loss could affect producers elsewhere and so reduce EC production. The net effect could be a small rise in EC market prices for sheep while leaving income for sheep farmers substantially reduced due to the reduction in subsidies.

An interesting feature of these proposals is that they attempt to break the traditional link between production or output and support, whereby those responsible for the most production receive the bulk of support. They also attempt to redirect support from larger producers to smaller and medium size producers by attempting to provide full compensation for smaller producers for any income losses incurred due to price cuts. While beneficial for Irish farmers this reorientation will aggravate losses by farmers in the UK and the Netherlands.

This change is in recognition of the fact that current CAP spending has tended to benefit most the largest of the Community's producers and has done little to prevent the decline in the agricultural population. The environmental problems caused by over-intensive production methods are also addressed in these proposals. The link between compensatory payments and producers' stocking density is an attempt to encourage "extensification" in agriculture or less intensive methods of farming.

2.3 Effects on Irish Agriculture

For simplicity in analysing the effects of the MacSharry package we have used a 1990 basis. We have changed the prices and quotas and examined what the effects of the package would have been in that year if it had been implemented instantaneously. The use of a

different basis would have made little difference to the results but it would have increased the complexity of exposition. In the next section, where we analyse the macroeconomic effects, we assume that the package is implemented over the period 1991-95.

As outlined above, we have assumed that the EC market price for the different products will be largely determined by the balance of supply in the EC for the product in question. So, given the extent of over-supply in the cereals sector, we would expect that cuts in intervention prices of 42% would translate into cuts in producer prices of approximately 40% for tillage products.

Using this rationale, we estimate that producer prices for milk would not fall by the full 10% outlined in the proposals. Due to the fact that there would be additional cuts in milk quotas, we would expect producer prices to fall by approximately 5%. We would expect beef prices to fall by the full 15% proposed in the document. The price of residual outputs, i.e., pigs and poultry is expected to fall by approximately 6.5%. However, this fall could be somewhat larger because of competition from the beef sector where prices are expected to fall by 15%. It is possible that white meat prices would have to fall by a similar amount. In addition to this, given the fact that cereals make up a large proportion of the cost of producing white meat, the fall in feedstuff prices could mean a large increase in profitability in this sector. This would increase output which would drive down price. Prices in the sheep-meat sector would rise by approximately 5%. The price of other inputs, such as fertilisers are assumed to fall by 5% because of a general decline in demand within the EC as a result of the reform package.

In most cases, we have allowed the model to determine the changes in quantity supplied as a result of changes in price. However, in the case of the dairy sector we have imposed a volume reduction of 3.5% corresponding to a reduction in milk quotas. We have also assumed that production of pigs and poultry would increase by 2.5% reflecting producers' response to the price and quota cuts in other farming enterprises. The results of our analysis in terms of changes in the volume and value of agricultural output can be seen in Table 7.2 below.

We estimate that the effect of these price reductions would be to reduce the value of Gross Agricultural Output (GAO) by almost 17%, with the price of GAO falling by almost 13% and volume falling by 4%. We estimate that the value of inputs - materials and services excluding labour, would fall by almost 16%, with price and volume falling by 8.8% and 7% respectively.

The one surprising result is the increase in sheep production in spite of the substantial reduction in the profitability of this enterprise. While the model suggests that this arises because the reduction in profitability of cattle is even greater, resulting in a switch from cattle production to sheep this is unlikely to occur in reality.

We would expect that levels of EC subsidies would increase substantially under the reform package and we estimate that the effects of increased compensatory payments for milk, beef and cereals producers, in addition to the abolition of the co-responsibility levies could increase the level of EC subsidies by approxi-

**Table 7.2: Effects on Agricultural Output
1990 basis**

	% Change		
	Price	Volume	Value
Milk	-5.0	-3.5	-8.5
Cattle	-15.0	-6.5	-21.5
Sheep	5.0	5.5	10.5
Tillage	-40.0	-5.0	-45.0
Residual Output	-6.5	2.5	-4.0
Gross Agricultural Output	-13.0	-3.7	-16.7
Fertiliser	-5.0	-10.5	-15.5
Feedstuff	-15.0	-3.6	-18.6
Energy	0.0	-11.2	-11.2
Labour	0.0	-6.0	-6.0
Residual Inputs	-5.0	-9.0	-14.0
Inputs Materials/ Services	-8.8	-7.0	-15.8

mately £117m. However, as we have already pointed out, this figure could be significantly reduced given the conditions necessary for full compensation which we outlined earlier. (The 1990 figure for "Subsidies minus Levies" was inflated due to exceptional factors at work in that year related to the need to bring the bulk of payments onto a current year basis. As we are not concerned here with forecasting farm incomes for 1991, we have not made any adjustment to the 1990 figure for net subsidies.)

Table 7.3 summarises the effects of these proposals in terms of their impact on Gross Agricultural Product at market prices and factor cost, Net Agricultural Product and farm incomes. While the value of Gross Agricultural Output falls by 16.7% there is a very substantial reduction in usage of inputs. The net effect of these two changes is a reduction in Gross Agricultural Product at market prices of 17.4%. There is a big rise in subsidies. When combined with the abolition of the co-responsibility levy the final effect on farm incomes is likely to be a reduction of nearly 11.5% below the level they might have reached under an unreformed regime.

The effect of these proposals on land values in the agricultural sector is an important question and one which is not captured in our modelling framework. Given the large fall in tillage prices which is proposed, it is likely that rent paid by large cereals producers for conacre could fall sharply. Another important determinant of land values will be the alternative uses to which agricultural land can be put. There is already a switch of land and resources into forestry. The incentives provided by the EC to move into forestry appear to be quite attractive to marginal farmers. This trend could receive a major stimulus from the cutback in the profitability of agriculture. However, the existing model cannot handle such effects and the likely outturn remains a matter for speculation. Unless farmers can find alternative products to produce, there could be a loss of farm employment not foreseen in our model. To

Table 7.3: Agricultural Output and Income

	Base	Change		Post Package
	£M	%	£M	£M
Value GAO.	3170	-16.7	-529	2641
Value Inputs	1372	-15.8	-217	1155
Gross Agricultural Product, Market Prices	1798	-17.4	-312	1486
Subsidies Minus Levies	329	+35.5	+117	446
Gross Agricultural Product, Factor Cost	2127	-9.2	-195	1932
Depreciation	340	-	-	340
Net Agricultural Product, Factor Cost	1787	-11.0	-195	1592
Wages/Salaries	147	-6.1	-9	138
Income From Self Employment	1640	-11.4	-186	1454

the extent that alternative uses are found for the land and farm labour, the loss of income could be ameliorated.

While we have presented the changes in output and incomes in some detail it should be stressed that the size of the changes envisaged in the package is very large and there must be a considerable margin of error in the model's estimates. However, because of the inter-related nature of the decisions errors may, to some extent, be offsetting.

3 MACROECONOMIC EFFECTS

While the most immediate impact of the reform of the CAP will fall on the farming community it will also have consequences for the economy as a whole. Here we examine these wider economic consequences using the ESRI *Medium-Term Model* of the Irish economy.

The knock-on effects of the fall in farm prices and the volume of agricultural output will take a number of forms affecting the food-processing sector, consumer prices, farmers' consumption and the government's finances. The effects of CAP reform operating through these different channels will interact producing a range of secondary effects.

Because the reform of the CAP will affect the agricultural sector in all member states of the EC (and agricultural producers in the rest of the world) the Irish economy will also face changes in the world economic environment in which it operates. It is essential that these wider effects are taken into account in any simulation. To ignore them and assume that the fall in prices in Ireland was not matched in other members states would assume an exaggerated improvement in the competitiveness of the Irish industrial sector. However, while a macro-model is readily available for the Irish economy, a much cruder approach is adopted here to the EC wide macroeconomic effects of CAP reform.

In this section we first consider the economic channels through which the changes in the agricultural sector will impact on the Irish economy. We then set out the assumptions we have made concerning the reaction to the changes in other EC member states. Finally we use the model to quantify the macroeconomic effects of these changes in agricultural output and prices. We have assumed that the reform of the CAP takes place as set out in the leaked *MacSharry* proposals (discussed in the previous section) and that the changes are implemented in five equal steps over the period 1991-95. Because the supply side of the economy takes time to react to these shocks we trace the macroeconomic effects out to the year 2000. Even after that date there may be some further changes, in particular due to the slow speed of adjustment in the structure of the food-processing industry.

3.1 Channels of Influence

The fall in the volume of agricultural output will reduce the turnover of the food processing sector of industry. In addition, some of the benefits of the CAP have, in the past, been captured by the food-processing industry as higher prices and margins. The resulting profits will be adversely affected by the fall in support prices for agricultural produce. The fall in throughput in the food-processing sector will lead to an even bigger fall in employment than would otherwise be the case (see Chapter 4 of this *Review*).

The fall in the price of agricultural output both in Ireland, and elsewhere in the EC, will directly benefit consumers in Ireland (and in the rest of the EC). The fall in prices will lead to lower pressure for increases in money wages in future years. This reduction in the rate of wage inflation will, in turn, feed back into prices. The net effect will be a substantial reduction in the price of labour faced by the industrial and services sectors. This will tend to benefit employment growth. However, the precise effects will depend on the extent to which prices change elsewhere within the EC. To the extent that there is a gain in the competitiveness of domestic industry, there will be some rise in industrial exports to offset the fall in agricultural exports.

As outlined earlier, the fall in farmers' incomes will be substantial. This will lead to a fall in economy-wide consumption which will, in turn, cut the demand for domestically produced goods and services. However, because of the openness of the Irish economy, the negative *multiplier* effect of this fall in consumption will not be very great. As with all consumption, much of the fall in farmers' spending will affect the demand for imported goods.

Finally, the decline in domestic economic activity will adversely affect the government's finances. The high level of debt, which is fixed in nominal terms, means that the fall in the value of GNP, not just the volume of GNP, increases the burden of debt interest payments. Because Irish nominal interest rates in the 1990s will be effectively determined by rates in the EC as a whole they will not fall as a result of the fall in the domestic price level. Thus real interest rates will rise in Ireland. This will be particularly serious for the government finances.

To offset the rise in the debt/GNP ratio the government would have to raise taxes or cut expenditure, giving rise to a further deflationary effect on GNP. In a separate sub-section we examine the combined effects of the CAP reform package and an increase in the rate of direct taxation designed to hold the debt/GNP ratio unchanged in the year 2000.

3.2 EC Wide Macroeconomic Effects

The effects, described above, will be felt throughout the EC. While the fall in farmers' consumption will not be significant in the context of the major EC economies, the fall in prices will be detectable. Food accounts for between 15% and 25% of consumers' expenditure in France, the UK and Germany so that consumer prices will fall by a number of percentage points.

A fall in consumer prices elsewhere in the EC will only affect Ireland indirectly through changing disposable incomes abroad and through indirect effects on wage rates and output prices of manufactured goods in the EC. The effect of the fall in agricultural prices on output prices and wage rates will be more muted than on consumer prices. We have assumed that output prices and wage rates fall by around 2% over the period of the adjustment of the CAP. The fall in Irish import prices is assumed to be only 1%, reflecting the preponderance of manufactured and semi-manufactured goods and the significance of imports from the US and other non-EC locations. Finally, we have not allowed for any fall in European interest rates as a result of the lower rate of inflation.

With the exception of the agricultural sector, we have not taken account of any output response in the EC resulting from the fall in prices. The possible channels for such an effect are so diverse that quantification is difficult. To the extent that they occur they will tend to offset the adverse effects on the Irish economy of the CAP reform package, discussed below.

3.3 Effects on Economy - Higher Debt

The effects of the CAP reform are assumed to be phased in over a five year period 1991-95. In this simulation we made no change in domestic taxes or in the volume of government expenditure, allowing the debt/GNP ratio to rise as the level of economic activity is adversely affected by the problems of the agricultural sector.

We present our results as changes compared to a baseline projection. The baseline used is the central forecast in Chapter 4 of this *Review*. This baseline projection is a characterisation of what might happen without a major reform of the CAP (assuming that the size of the EC budget is variable). Using the model we have changed the agricultural assumptions to see what are the effects on the economy in the period to the year 2000.

The volume of agricultural output falls by almost 4% by 1995 and there is a 13.5% fall in agricultural prices. While there is a substantial rise in EC transfers to the farming community in the same period, there is still a reduction in farmers' incomes in 1995 of around 10%.

Figure 1
Food Industry
Output, volume

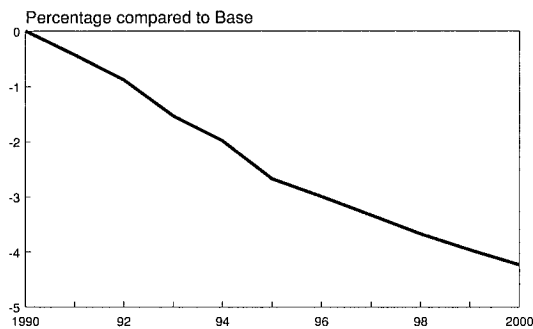


Figure 2
Total Employment

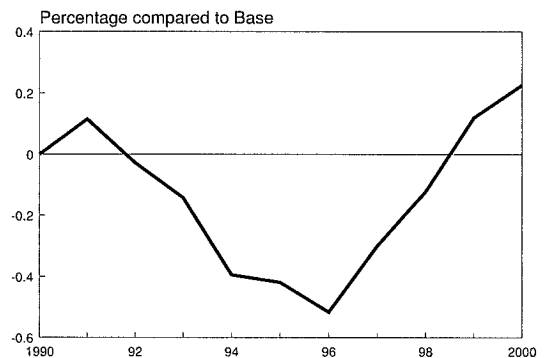


Figure 3
Prices and Wages

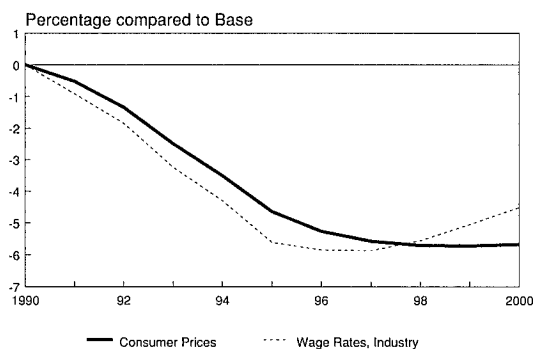


Figure 4
GNP
Volume

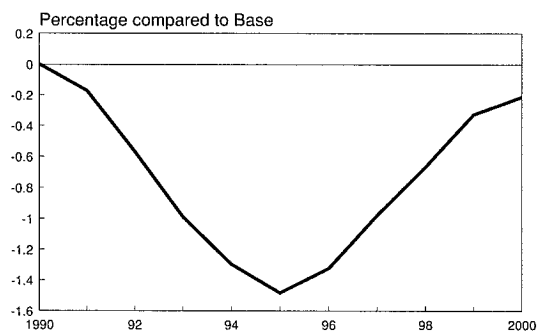


Figure 5
Debt / GNP Ratio

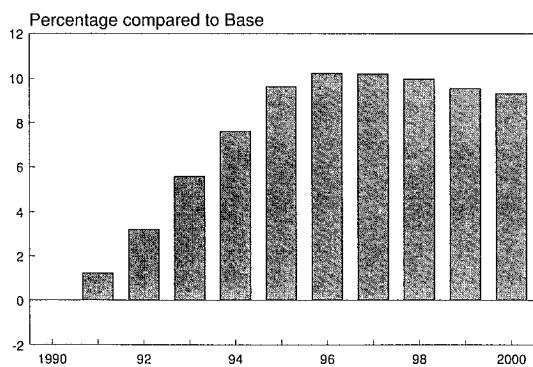
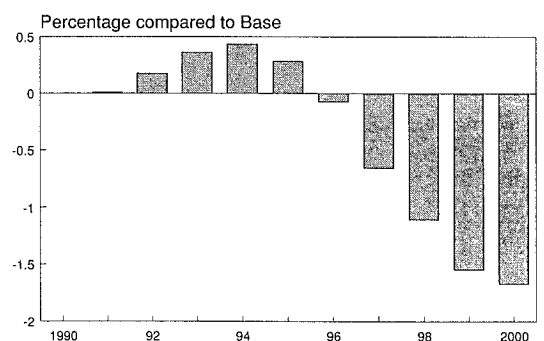


Figure 6
Balance of Payments
Surplus as % of GNP



The fall in income adversely affects consumption. At its lowest point in 1995, consumption is down by 2% in volume. The fall in the volume of agricultural output reduces the materials available to the food sector for processing. Food-sector output falls slowly as the capacity of the sector contracts (Figure 1). The fall in output in 1995 is 2.7%, rising to 4.2% by 2000. Even by the end of the decade the effects on the food sector are not complete. It could be expected to suffer a fall in output in the long-term of up to 7.3%.

The fall in farm income and farm spending affects investment, particularly in building. The output of the services sector is also hit by the fall in consumption.

Together these forces result in a reduction in total employment in the economy of 4,900 or 0.43% by 1995 (Figure 2).

Real disposable income in the non-farm sector rises directly as a result of the price cuts. However, this is not nearly enough to compensate for the reduction in farm incomes. The reduction in prices also sets in train a series of forces which gradually offset the effects of the cut-backs in agriculture on national output.

This fall in agricultural prices first affects consumer prices. The fall in prices, in turn, affects wage rates. Wage rates are also affected by the rise in unemploy-

ment and the problems in the food processing sector. By 1995 wage rates are reduced by over 5% below the level they would otherwise have been (Figure 3). The fall in wage rates reduces prices further. This cycle continues over a number of years.

As indicated above, we have assumed that prices and wages fall in other EC countries. However, because of the much smaller role of agriculture and food-processing in those economies, the reduction in prices and wages is assumed to be less than in Ireland. This gives rise to a gain in Irish competitiveness. In the long run, this is more important than the income effect of the fall in prices. However, considerable uncertainty must surround the assumption concerning the effects of CAP reform on foreign prices. If it proved greater than we have assumed and Irish competitiveness improved by less than shown here, the costs of CAP reform to Ireland would be greater than we have estimated.

Because interest rates are effectively externally determined the fall in inflation increases domestic real interest rates. This has adverse implications for the government and also for the private sector as a whole.

This improvement in competitiveness takes time to translate into increased output. It is only after 1995 that industrial output in the traditional and high technology sectors begins to rise. By 2000 the competitiveness induced increase in industrial output goes a long way to offsetting the loss to the Irish economy from the agricultural cut-backs. By 2000 GNP is only 0.2% below the level it would otherwise have been (Figure 4). Because of the improvement in competitiveness industrial employment rises leaving a small net increase in total employment by the end of the decade (Figure 2). The effects on emigration and employment are, as a result, small.

While the effects on GNP are somewhat reduced by the year 2000, the debt/GNP ratio still remains nearly 10 percentage points above the level in the baseline (Figure 5). The lower rate of inflation means that the value of GNP is below the level it would otherwise have been and that the burden of the debt, fixed in nominal terms is increased. This reflects the adverse effects on the terms of trade of the changes in the CAP. The agricultural exports, notionally attributable to paying foreign debt interest, are worth much less than they are today. In the next section we consider the effects of government action designed to hold the debt/GNP ratio unchanged at the baseline level.

The fall in agricultural investment over the period is not surprising. However, there is also a fall in investment in the rest of the economy as the cost of capital rises due to rising real interest rates while the cost of labour falls. (It becomes profitable to slow-down the rate of substitution of machines for employees.) Because investment has a high import content imports are reduced in volume by around 2.7% by 1995. However, in the following five years the improvement in competitiveness results in a recovery in investment (other than in the food sector). This, together with the increase in industrial output, reverses the trend in imports.

Initially the cut-backs in agriculture arising from the CAP reform seriously reduce the volume and value of agricultural exports. However, the adverse effects on the balance of payments are offset in the earlier years by the fall in imports discussed above. As the economy adjusts the balance of payments is adversely affected from 1996 onwards (Figure 6). By 2000 the disimprovement in the balance of payments amounts to 1.7 per cent of GNP.

Without remedial action to deal with the balance of payments position and the increased debt/GNP ratio the situation would deteriorate further. This is the ultimate measure of the long-term impact of the CAP reform proposals on the Irish economy.

3.4 Effects on Economy - Unchanged Debt

A second simulation was carried out to examine the possible combined impact of the CAP reform proposals and of measures to keep the debt/GNP ratio at the baseline (central forecast) level. There is obviously a wide range of possible measures to stop the debt/GNP ratio rising above the level it would otherwise have achieved. In this simulation, for illustrative purposes, we have assumed that the debt reduction is achieved by raising the rate of personal income tax above the level in the baseline projection. As shown in Figure 7, the increase amounts to 3.2% of personal income by 1995 (£700 million in 1991 terms). This increase is quite severe and the economic impact of such a change may be greater than if the debt reduction were financed by cuts in expenditure. After rising up to 1995 the effect of this measure is to leave the debt/GNP ratio almost unchanged by the year 2000 (Figure 8). Thereafter the tax increases could probably be gradually reduced.

The effect of the action to hold the debt/GNP ratio unchanged is to greatly increase the long-term impact of the CAP reform on the Irish economy. By the year 2000 GNP is nearly 1.2% below its baseline level (Figure 9). The increase in taxes aggravates the situation in two ways. It directly reduces purchasing power. It also means that the reduction in the rate of inflation is less than in the previous simulation (Figure 10). Because workers bargain in terms of after tax wages the tax increases alter the wage moderation effects of the fall in agricultural prices. This means that there is a smaller improvement in Ireland's competitive position.

The generally lower level of activity in the economy leads to a much reduced demand for imports which, in turn, leads to a small improvement in the balance of payments position by the year 2000 (Figure 11).

The effect of the rise in taxes on wages is to choke off the competitiveness gains in the industrial sector leaving employment in that sector unchanged. However, employment in market services falls by 3% as a result of the fall in domestic economic activity. For example, lower consumption means fewer people employed in the distribution sector. Taken together total employment falls by 1.3% by the year 2000 (Figure 12). The unemployment rate rises by a maximum of 1 percentage point in 1995 and falls thereafter as emigration picks up (Figures 13 and 14). The rise in emigration results in the population in 2000 being 1.3% below the level it would have been without the changes

Figure 7

Rate of Direct Tax
Tax as % of Total Earnings

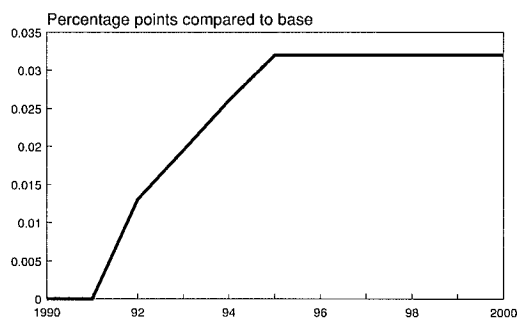


Figure 8

Debt / GNP Ratio

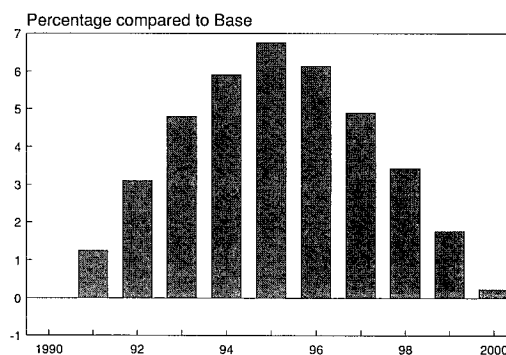


Figure 9

GNP
Volume

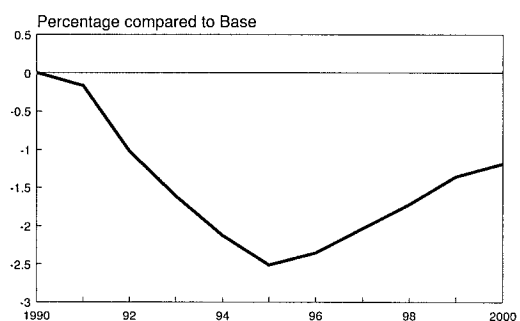


Figure 10

Prices and Wages

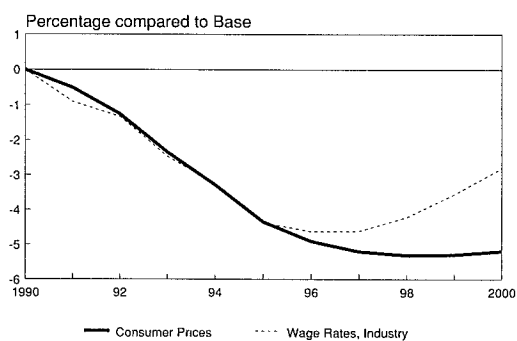


Figure 11

Balance of Payments
Surplus as % of GNP

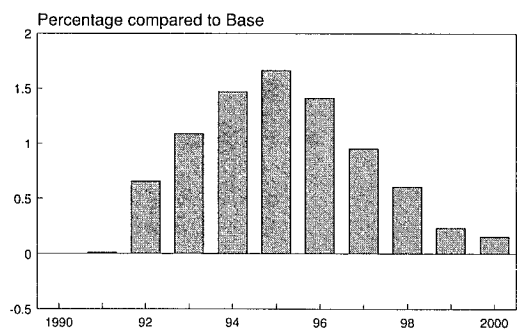


Figure 12

Total Employment

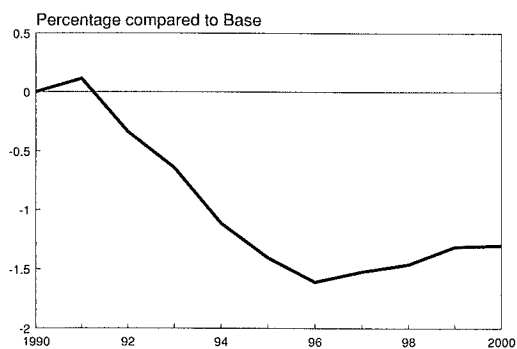


Figure 13

Unemployment Rate
Percentage of Labour Force

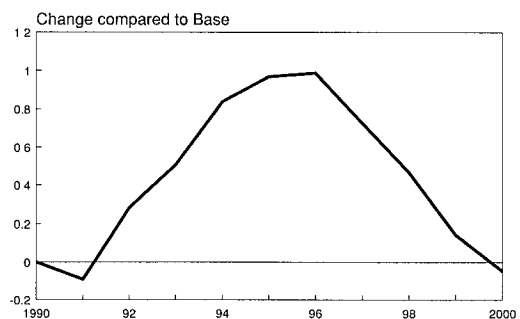
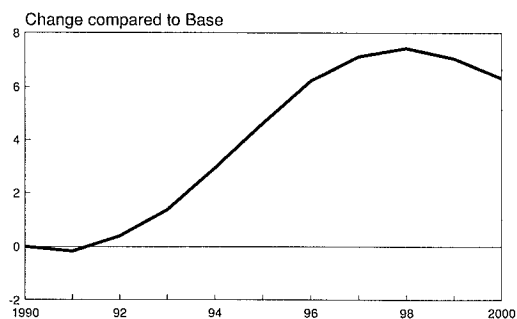


Figure 14

Emigration
Thousands



in the CAP. This means that GNP, while falling in absolute terms, is relatively unchanged in terms of GNP per head, due to the higher level of emigration.

In the very long term it seems likely that the Irish economy could settle down to a new equilibrium level of GNP between 1 and 1.5% below its baseline level while leaving the debt/GNP ratio and the balance of payments unchanged. It would also lead to a major redistribution of income away from the farming sector to the rest of the economy.

4 CONCLUSIONS

4.1 Economic Effects

This article has concentrated on an examination of the implications for the Irish economy of the leaked document for reform of the CAP. It is clear that these proposals must be seen as the opening shot in what will undoubtedly be a long debate. The parallel development of the GATT negotiations means that the final decision on how the CAP should develop over the next ten years must take account, not just of the financing needs of the CAP itself, but also of the wider implications for the world market in agricultural products.

Because of the global nature of the market for Ireland's agricultural output, much will depend on how farmers in other countries, both inside and outside the EC, will react to the changes in prices and production quotas. What is a very unpalatable package for Irish farmers is even more unpalatable for farmers in some other EC member states. As we outlined earlier, the reform package is oriented towards the smaller and medium size producer, of which Ireland has a greater number than do countries such as the UK or the Netherlands. We have discussed above the importance of the supply response in other EC member countries to major cuts in output prices. In the absence of a full model of the agricultural sector elsewhere in Europe, it is difficult to gauge the likely size of this response and the assumptions made in this paper remain tentative. Whatever the effect on farming sectors within the different member States, it is the overall macroeconomic effect of CAP reform within these States which is probably the more important issue, given its importance in shaping national attitudes to CAP reform.

The absence of a model of the wider European economy (as opposed to the European agricultural sector) also gives rise to uncertainty concerning the response of prices, wages, and output elsewhere to the changes in the CAP. As these changes have important implications for Ireland's competitiveness they make the quantification of the long term impact of CAP reform on Ireland rather difficult. In our analysis we have not taken account of the possibility of increased output in the EC consequent on an improvement in the efficiency of the EC agricultural sector.

The analysis outlined above suggests that the proposals would knock around 10% off farmers' incomes over the period of the adjustment. Agricultural output could fall by around 4%. When the wider economic effects of this shock to the Irish economy are taken into account the loss in GNP in the medium to long-term could be of the order of 1.5% of GNP, with a somewhat greater loss in the initial years of the adjustment. The

loss in foreign earnings will necessitate a more stringent domestic fiscal policy over the rest of the 1990s than would otherwise have been the case. The adverse effects on employment may be limited because numbers employed in farming have proved slow to respond to changes in income. However, the corollary of this is that the loss in income per head in agriculture will be quite severe.

The adverse effects of CAP reform will do much to offset the beneficial impact of the Community Support Framework on the level of GNP. The cost of the CAP reform could offset up to half the benefits (measured in terms of GNP) expected to arise from the CSF by the end of the decade (Bradley, Fitz Gerald, and Kearney, 1991).

The problems posed for the Irish economy by the CAP reform are heightened by the extent of the government's indebtedness. A high level of debt aggravates the effects of shocks to the terms of trade and of shocks which raise real interest rates. The difference between the two simulations shown above highlights the fact that the long-term effects of the CAP reform on the Irish economy will be greatly aggravated by the size of the government's debt.

There remain many areas of uncertainty as to how the agricultural sector will respond to the shock of CAP reform. Any model, such as that of the agricultural sector used in Section 2, has problems dealing with large shocks. The loss of income resulting from CAP reform, combined with the restrictions on shifting production to alternative products, makes it likely that the price of agricultural land will fall. This may induce a growth in other forms of land use, such as forestry, which could provide some offset to the loss of agricultural output. In addition, for the food processing sector, the effects will depend very much on the type of reform package eventually chosen.

However individual farmers react to the reform of the CAP, it is clear that the farm sector will suffer a substantial loss of income. For the non-farm sector, if the government could ignore the adverse effects on the debt, there would be an increase in real disposable income because of the fall in prices. However, the non-farm sector of the economy will have to bear the brunt of measures to control the potential increase in the debt/GNP ratio above what it would otherwise have been. When this is taken into account, it is clear that they too will suffer from the reform of the CAP. However, the major impact of the CAP reform will, obviously, still fall on the farm sector itself. Farmers have real problems!

4.2 Policy Response

In the short term the uncertainty about the future for Irish agriculture raises questions about priorities under the EC Community Support Framework. It would appear to be wiser to devote resources currently being devoted to promoting agricultural output to other uses, which could provide a more lasting improvement in living standards in rural areas. If and when the CAP is reformed some of the investment currently being financed by the CSF could prove to be unproductive.

In the past consideration of how the CAP should be reformed has been hampered by a fear that any talk of changing the CAP could damage Ireland's negotiating position. However, it has been clear for many years that the CAP, as presently constituted, can not continue indefinitely. The failure to plan for a reform, both politically and economically, may prove expensive.

It is clear that the CAP is inefficient. Pressures are building up for reform. The political power of farmers in the EC is being eroded. It is time to consider how the twin objectives of reforming the CAP and safeguarding Ireland's long-term position can best be achieved. If Ireland promoted a sustainable long-term reform of the CAP which dealt with the obvious inefficiencies in the current system it might set the agenda for the subsequent debate. In doing this we would be more likely to achieve the package of reforms which was least unfavourable for the Irish economy. By waiting for other nations to set the agenda the initiative may be lost.

The set of proposals contained in the MacSharry package seem to some extent to be chosen with Irish interests in mind. They constitute a more serious direct threat to French and UK farmers, in particular grain farmers. For Irish grain farmers most of their losses will be compensated for by additional subsidies. For larger farmers, who account for much of the grain production in France and the UK, the proposals will represent a very serious cut in their incomes.

Even for animal products, the provisions for limited compensation for small producers are designed to have a bigger impact in Ireland than for the large factory farms found in the Netherlands and elsewhere in Northern Europe. However, the fall in input prices may heighten competition in this sector from intensive producers on the continent. The price of pork and poultry products is likely to fall putting further pressure on beef prices.

It may not be a palatable package for Ireland but it is likely to be a less unfavourable battle ground than might have been designed by, for example, the Dutch Minister for Agriculture.

While these proposals go some way towards meeting the needs of GATT, the cuts in grain prices may still leave a substantial surplus within the EC with corresponding pressures on export credit refunds. Thus they can not be seen as the ultimate CAP reform.

There are two possible routes that long-term reform could take. The first, what one may characterise as *fortress Europe* approach, involves the use of quotas and other restrictions on output to keep production in the EC broadly in line with consumption. The alternative approach is to go for free trade in agricultural produce. While any major reform package will lie between these two extremes it is worth considering the polar cases.

To some extent the EC Commission has already chosen to follow the *fortress Europe* approach with the introduction of quotas for a wide range of products. While an extension of this approach would reduce the pressure from outside the EC for reform of the CAP it would not eliminate it. It would also lead to additional distortions and inefficiencies in European agriculture. It would further institutionalise a regime where farmers may operate well below their optimal level of produc-

tion and where the determinants of output are not economic efficiency but the rather arbitrary allocation of property rights constituted by the quota system.

In the absence of changes in EC membership, the institutionalisation of such a quota system could preserve the structure of the CAP while keeping it within its budget. However, it is questionable whether it could provide a long-term solution. The inefficiencies institutionalised in it would tend to grow over time and to attract adverse reaction from non-farmers. With farmers numbers and, consequently, political power, falling in the EC, it could give rise to increasing pressures for renewed reform.

In addition, with the EC likely to grow in size over the next twenty years, each new member admitted would pose new problems for a reallocation of the property rights enshrined in the quotas. We have already seen how the unification of Germany has aggravated the current crisis for the CAP. There will be increasing pressure to accord increased access to the EC market to Poland and Hungary. To refuse such access could hinder their process of economic adjustment and hence could attract major political opposition within the EC. Finally, such a solution could block the development of some Third World countries which might otherwise prosper through selling their products on the EC market.

The alternative approach, which may attract political support in the EC, would be to recognise the inefficiency of the quota system and to try and design a system where the CAP would move towards a multilateral freeing of world trade in agricultural products while providing substantial compensation to the farmers of the EC who would lose from this change. Whoever first tabled such a set of proposals would have the opportunity to make the first proposals concerning how the compensation package would be operated. Would it be in Ireland's interest to set this agenda?

This approach would involve a major fall in the EC price level. If undertaken as part of the GATT there would be some rise in the world market price as subsidies in the USA and elsewhere were also removed. While leaving prices at less than half their current levels, this would reduce the losses suffered by Irish farmers below what they would be at current free market prices. However, the losses would, without compensation, be very large with prices for dairy produce being, at best, halved.

To determine what the final effects of such a change would be on Irish farming requires information on how farmers, not only in the EC, but throughout the world, would respond to such changes. Much would depend on the relative supply response in the different parts of the world. If Irish producers were to prove more competitive than the average, then output might rise, with consequential benefits for the food processing sector. On the other hand, if they were priced out of the market by other producers, the result could be further pain for food processors. Work on models to answer such a question is only at an early stage in the OECD.

As Irish farmers currently receive around 40% of their income directly or indirectly from the CAP budget there is already a high level of compensation from the EC budget. What is not clear is how much higher this compensation would have to go under a free market regime to hold incomes unchanged. It may well be possible to design a scheme which would achieve such an objective for Irish farmers, in particular if some of the major benefits to European consumers of lower prices from the freeing of trade were captured by the EC budget. However, gaining acceptance for such a scheme could prove difficult politically within the EC.

Any such move towards direct compensation could pose long-term political, and even social problems. Such transfers could themselves come under scrutiny in the face of demands from other disadvantaged groups within the EC and even outside it. As the right to transfers became divorced from agricultural production the determination of who should receive such transfers would obviously pose major political problems. In making the dependency of the agricultural sector on transfers from the EC explicit it could also prove damaging socially.

We do not feel that the current state of research allows us to decide what is likely to be the best economic approach to increasing the efficiency of the CAP while safeguarding Irish interests. Even if we could give a clear answer on economic criteria it is for others to decide what is likely to be the approach most likely to succeed in the context of EC politics and the politics of the GATT. However, what is certain is that the necessary research should be undertaken to establish where our best interests lie. When that is established Ireland should take a more active role in promoting our preferred reform of the CAP.

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MACROECONOMIC IMPACT OF ENVIRONMENTAL POLICY ON ACID RAIN

by Daniel McCoy

1. INTRODUCTION

The ESRI Medium Term macro-model is more than just a forecasting tool. One of its main uses is to permit coherent macroeconomic simulations of medium term policy options in a variety of areas, even when these are far removed from direct economic management. This ability of the model is illustrated in the article on the possible consequences of CAP reform. The purpose of this article is to demonstrate how the model can be applied to options in the area of environmental policy.

Environmental concerns have only emerged to the forefront of the international political agenda during the last five years. However there has been a persistent concern over the last two decades about the implications of economic growth for the environment. This issue received much economic attention in the early 1970s before policy makers' became distracted by the oil supply shocks and their consequences for the world economy.

Environmental issues will become increasingly important during the 1990s, both domestically and through EC and world organisations. Water pollution, mainly agricultural related, is Ireland's most important environmental problem. The important global issues include the "greenhouse effect" and depletion of the ozone layer. The problem of acid rain is an important issue for North America and Europe but it is a less significant problem for Ireland.

Evolution of policy towards environmental issues will be driven both by national self interest and by international obligations. The motivation for Ireland adopting high profile positions on environmental matters could stem from the sizeable trade benefits of enhancing our "green" image.

Whatever policy aims are adopted, choices will need to be made concerning the methods of achieving them. The specific purpose of this article is to show how model-based simulation can assist in making the correct choices.

The case study chosen is the reduction in sulphur dioxide (SO₂) emissions in Ireland. This is the first major issue where Ireland has made a specific commitment. The fact that, on its own, this decision provides little domestic environmental benefit simplifies the analysis and this makes it particularly suitable as a pilot study. More complex use of this approach can then be applied to other environmental issues as they arise, such as the much more significant problems involved with carbon dioxide (CO₂) emissions.

The article has the following structure, Section 2 describes the acid rain problem. Section 3 describes environmental policy on SO₂ reductions. Section 4 describes the methodology used to analyse the effect of economic activity on the level of SO₂ emissions and the impact of the policy to reduce acid rain on the Irish economy. Section 5 describes a number of strategies proposed to achieve the environmental targets. Section 6 describes the macroeconomic and environmental impacts of each strategy, while Section 7 outlines the conclusions from the analysis.

2. THE PROBLEM OF ACID RAIN

The term "acid rain" describes the acidity of depositions of pollutants. Wet deposition is formed by rain, snow and fog while dry deposition is made up of gases and solid matter like ash and soot. The damage caused by acid rain includes : the speeding up of the disintegration of buildings and statues; soil erosion; acidification of lakes; forest death and it is also a threat to human health. Acid rain is formed by the combination of SO₂ and nitrogen oxides (NO_x) emissions into the air. The emissions of SO₂ are a by-product of the burning of fossil fuels, such as coal and oil, for energy use.

Acid rain does not respect national borders so it is a transnational problem. The degree of environmental damage caused by acid rain depends on where it is deposited rather than from where its acid-forming pollutants are sourced. Where the depositions occur is important because receptors have various abilities to absorb depositions before "critical loads" are reached. These loads are reached when irreversible damage is caused to the environment.

The deposition of acid rain depends on the source of the acid-forming pollutants and on air movements carrying the rain. The European Monitoring and Evaluation Programme (EMEP) has developed a model, using air movements, to track pollutants from their origin to their deposition. This model determines the spatial relationship between emissions and depositions of pollutants in the form of source/receptor matrices on a European scale.

Table 1 shows such a matrix for a selection of European countries' SO₂ emissions and depositions for 1987. The vertical columns show where a country's emissions are deposited while the horizontal rows show where a country's deposits are sourced. The diagonal entries show the depositions from domestic source while the off-diagonal show the spillovers between countries.

TABLE 1: Origins of SO₂ Depositions in Europe in 1987
(Thousand of Tonnes)

Receivers:		Emitters													TOTAL
		BL	CZ	GD	FR	HU	IB	IR	PL	SC	UK	SU	FG	OE	
Benelux	BL	194	8	29	61	0	4	0	8	0	59	0	97	0	460
Czechoslovakia	CZ	10	732	243	21	86	2	0	181	0	13	4	53	48	1393
East Germany	GD	21	160	1378	27	4	2	0	61	0	29	2	116	10	1810
France	FR	53	36	78	631	10	127	2	29	0	82	0	76	49	1173
Hungary	HU	2	59	30	6	361	0	0	48	0	2	2	11	76	597
Iberia	IB	2	4	10	21	4	1125	0	6	0	11	0	6	6	1195
Ireland	IR	2	0	4	4	0	0	40	2	0	32	0	2	0	86
Poland	PL	19	276	589	29	76	2	0	1501	2	29	34	89	59	2705
Scandinavia	SC	11	40	106	10	11	0	0	106	228	67	171	40	46	836
United Kingdom	UK	15	10	29	27	0	4	11	6	0	1085	2	21	42	1212
USSR (European)	SU	15	203	317	19	160	2	0	640	57	30	4188	68	167	5866
West Germany	FG	84	89	310	131	6	11	0	44	0	86	2	627	36	1426
Other Europe	OE	19	198	194	112	285	38	0	194	0	103	74	101	1222	2539
Total Deposition on Europe		447	1815	3317	1099	1003	1317	53	2826	287	1628	4479	1307	1721	21298
National Emissions		743	2755	4750	1754	1349	3224	171	4313	623	3496	9690	1942	5996	40806

Source : Acid Magazine, September, 1989

For instance in 1987 Ireland emitted 11,000 tonnes of SO₂ to the UK while it received 32,000 tonnes from the UK. The domestic contribution to national depositions was 40,000 tonnes from a total emission of 171,400 tonnes. The total amount of Irish emissions that landed in Europe (including Ireland) was 53,000 tonnes. The remainder of these emissions are either unidentified or are deposited in the sea or in North Africa.

The striking features of the spillovers between countries are that Scandinavia receives large amounts of depositions compared to its emissions to mainland Europe. The UK emits quite large amounts compared to the depositions that it receives from other countries. The largest spillovers occur mainly between the East European nations. This is an indication of the very poor environmental performances of the former centrally planned systems.

The table also indicates that there are no close correlations nationally between emissions and depositions. There can be very low national deposition levels but the concentration of these depositions can vary within countries such that acid rain can be a serious problem in certain regions.

The ratio of domestic depositions to national emissions is 0.23, (i.e. 40,000/171,400). This means that for Ireland unilaterally to reduce domestic depositions by 1 tonne it would require a reduction in national emissions of about 4 tonnes.

The ratio of total depositions within Europe to total European emissions is 0.52, (i.e. 21,298/40,806), so to reduce European depositions by 1 tonne it would take a reduction in European emissions of about 2 tonnes. The average ratio for individual European countries domestic depositions to national emissions is 0.33 so it would take a reduction in domestic emissions of 3 tonnes to reduce European depositions by 1 tonne. This implies that by acting collectively the cost of reducing European depositions could be only two thirds of the cost of unilateral reductions. If the objective is European focused the advantages of multilateral response clearly outweighs those of unilateral action for the environment.

3. POLICY ON SO₂ REDUCTIONS

Any approach to the problem of acid rain should take account of its spatial impacts so that reductions in emissions could be focused on sources which contribute most to deposition on identified sensitive areas. These emissions are linked to economic growth through the energy factor of production. The production and use of energy has important environmental consequences for air pollution. The burning of fossil fuels emits high levels of SO₂ but also emits CO₂, which adds to the "greenhouse effect". There is international consensus that these activities need to be altered to help reduce the resulting environmental problems.

The international response to the acid rain problem is formulated under the 1985 Helsinki Protocol on reduction in sulphur emissions. This protocol is an agreement among a group of thirteen OECD countries, plus a number of Eastern block countries, to reduce SO₂ emissions by 30% of their 1980 national levels by 1993. This agreement is weakened by the failure of some of the largest emitters of SO₂ to accede to the protocol. These abstainers include the UK, Spain, Poland and the USA.

Environmental policy in Ireland is formulated under the authority of the Department of the Environment (DoE). On taking up the Presidency of the European Community at the beginning of 1990 the Irish government singled out the environment to be the theme of its tenure. An environmental policy document was published to outline the proposed actions that the government intended to pursue (*An Environment Action Programme* (EAP)).

The EAP states that Ireland's policy on acid rain will be in line with the Helsinki Protocol. The target for national emissions of SO₂ is 157,000 tonnes in 1993. The EAP indicates that the reductions in SO₂ emissions are to be achieved by use of regulation rather than by use of price instruments. Emphasis is placed on the power generation and industrial sectors to achieve the national Helsinki targets.

The emphasis on the power generation sector is common internationally because it is usually the largest source of SO₂ emissions in a country. The power generation sector accounts for over 50% of the Irish national emissions of SO₂ and 80% of this sector's emissions come from just two sources. It therefore tends to be more cost effective to abate SO₂ emissions at large power stations compared with the smaller dispersed sources in the domestic sector.

The emphasis on reducing SO₂ emissions from power plants is also consistent with EC policy. The 1988 EC Large Combustion Plant (LCP) directive seeks reductions of between 40% to 60% on 1980 SO₂ levels by 1993 for most member countries. The directive applies to plants of 50 MW capacity or more, so in Ireland it only applies to the Electricity Supply Board (ESB). Ireland has received a ceiling limit of 124,000 tonnes of SO₂ under the directive for such plant. This is well above the 1980 level of 99,000 tonnes from the power generation sector. The reason for this generous ceiling is that allowance was made for the large Moneypoint power plant which was not built until after 1980.

The target emission level agreed by the ESB with the DoE to fulfil its contribution towards the Helsinki requirement has been set at 75,000 tonnes by 1993. This is much more stringent than its LCP commitment. These target SO₂ emission levels for 1993 are :

Helsinki Target

National 157,000 tonnes
Power Generation 75,000 tonnes

Large Combustion Plant Target

Power Generation 124,000 tonnes

The EAP does not clearly specify whether the focus of Irish environmental policy on air pollution is on the domestic environment or on the global environment. Ireland's accession to the Helsinki Protocol, although not explicitly stated, must have been motivated from a concern about the problem of acid rain in Europe. In this article we assume that it is this wider European objective that underlies government policy on reducing SO₂ emissions.

Whatever is the underlying motivation for an environmental policy, its objectives should be that it is both effective in protecting the environment and that its implementation is efficient for the economy. These are the criteria which we use to evaluate Ireland's environmental policy towards acid rain. Effectiveness requires that the policy will actually reduce the problem of acid rain in Europe. Efficiency requires that the implementation of the policy is at the "least cost" to the economy for given environmental benefit. The cost to the economy is measured in terms of lost economic welfare.

The requirements of the Helsinki Protocol, which forms Ireland's policy, is not the most effective way to reduce the problem of transfrontier acid rain. The focus of the protocol is on SO₂ emissions, whereas to be more effective it should be on depositions. The equal percentage reductions on national emissions across countries, as used in the protocol, is a less effective solution than a "Critical Load" approach. This type of

approach involves reducing emissions from sources that deposit most on identified sensitive receptors to minimise damage.

The Helsinki Protocol is due for revision in 1993 so emission targets may be altered to address these defects. However for the purpose of this analysis we assume that the requirements of the protocol will remain unaltered for the coming decade.

The measure of responsibility for the damage caused by acid rain that we use is the ratio of a country's European depositions to national emissions. In Ireland this ratio is 0.31 compared with 0.58 for a block of Eastern European countries taken together, that we have chosen for illustrative purposes in Table 2. This Eastern European ratio is approximately twice the Irish ratio.

TABLE 2: Ratio Of European SO₂ Depositions To National SO₂ Emissions (Thousand of Tonnes)

Country	European Depositions	National Emissions	Ratio
Bulgaria	460	1083	0.42
Czechoslovakia	1815	2755	0.66
East Germany	3317	4750	0.70
Hungary	1003	1349	0.74
Poland	2826	4313	0.65
Romania	103	190	0.54
USSR (Eur)	4479	9690	0.46
Yugoslavia	675	1117	0.60
Eastern Europe	14678	25247	0.58
Ireland	53	171	0.31

Source : Acid Magazine, September, 1989

This implies that to achieve the same impact on the European environment only half of the required reduction in Irish SO₂ emissions would be required in Eastern Europe. This raises the issue of whether it would be more cost effective for countries to fully co-operate on a European-wide basis towards reducing the problem of acid rain. This co-operation could entail countries giving funds to others to achieve reductions in European depositions at much less cost than a dependence on separate national actions, as under the Helsinki Protocol.

This article examines a number of the proposed strategies to achieve the Helsinki target of reductions in national emissions of SO₂. These strategies are focused on the power generation sector. These include :

1. The installation of desulphurisation equipment in the ESB's coal fired generating stations.
2. The use of low sulphur coal to replace existing coal stocks for generating electricity.
3. The combined use of natural gas and low sulphur coal to generate electricity.

We include a fourth strategy to achieve a reduction in the problem of acid rain in Europe. This involves :

4. A direct transfer of funds from Ireland to Eastern Europe to install desulphurisation equipment.

This fourth strategy is not proposed to meet the national Helsinki targets but is included as an alternative strategy to reduce the problem of acid rain in Europe at the "least cost" to the economy. This strategy is only relevant if the objective of Irish policy is European focused rather than on the domestic environment. The transfers would replace, rather than being in addition to,

national abatement strategies. The countries in Eastern Europe, see Table 2, are chosen as the target for abatement funds because they are major contributors to the acid rain problem in Europe, they contribute about 70% to European SO₂ depositions. Also some of these countries would be unlikely to have the sufficient national wealth to afford the necessary abatement without requiring aid from other countries. If the concern is for the domestic environment then these transfers to Eastern Europe would not be a relevant option given their small spillovers of emissions with Ireland.

4. METHODOLOGY

This section describes the methodology used to develop the link between economic activity in the Irish economy and the national emissions of SO₂. It considers how the costs of the proposed strategies to reduce SO₂ emissions can be measured.

The link between economic activity and acid rain is established through the use of energy in the economy. Energy is a factor input in the production process of most economic activities and the use of energy is directly linked to growth in the level of activity in the economy. Sulphur dioxide (SO₂) is a by-product from burning fossil fuels for energy use. The quantity of SO₂ emitted for a given amount of energy depends on the mix of fuels used. The fuel mix depends on fuel availability, technology and relative fuel prices so in determining the fuel mix we have made assumptions about each of these factors.

First, we established the levels of SO₂ emissions from the different sectors of the Irish economy. The SO₂ emission levels were obtained from the Environmental Research Unit for 1987, which was the latest complete year, and for 1980, the base year for emission reductions. These are presented by sector in Table 3.

**TABLE 3: Irish SO₂ Emissions
(Tonnes per Year)**

Sector	1980	1987
Domestic	34700	28620
Industrial	80900	40240
Transport	5400	7345
Power Generation	101500	95195
Total	222500	171400

Source : Environmental Research Unit

**TABLE 4: Energy Use in Ireland,
Excluding Electricity
(Millions of Tonnes of Oil Equivalent per Year)**

Sector	1980	1987
Domestic	2.071	2.324
Industrial	1.682	1.661
Transport	1.761	1.781
Power Generation	2.677	2.926
Total	8.191	8.692

Source : Energy Balances, Department of Energy

The data on the energy used by each sector for these years is presented in Table 4. A striking feature from these tables is the dramatic reduction in the SO₂ emissions from the industrial sector for a similar use of energy. This reduction has mainly occurred as a result of the change in the fuel mix in this sector towards the

use of natural gas and away from high sulphur oil use. The opportunity to achieve greater reductions in emissions from this sector is limited.

From these data sources the SO₂ emission factors for energy use in each sector were derived using the 1987 levels. The growth in energy use in each sector depends mainly on the growth in economic activity in the sector and on the growth in energy prices. The sectoral growth rates are determined from our central forecasts given in chapter 4 of this *Review*. The link then is as follows

Economic Growth

=> Sectoral Growth

=> Energy Use Growth

=> SO₂ Emission Growth

The forecast for emission growth assumes that the relationship between sector output and energy use remains unchanged over the period. It also assumes that the fuel mix remains unchanged in the sectors other than power generation. The emissions from each fuel type are assumed to stay unchanged so that the emission factors for these sectors are the same as in the 1980s. These relationships will probably change over the coming decade due to factors such as energy efficient technical progress. However, any change in these factors, while affecting the benchmark, will not significantly affect our quantification of the impacts of the strategies.

Since the required SO₂ reductions in Ireland have been explicitly focused on the electricity industry we developed the link between economic activity and the demand for electricity. The link between the fuel mix used to generate the electricity and the subsequent emissions of SO₂ was also established. The demand for electricity depends mainly on economic activity and on electricity prices. Using our forecasts for the economy we projected the demand for electricity over the period 1991 - 2000.

From this growth in electricity demand we derived the quantities of fuels required for generation, assuming that the fuel mix and operating efficiencies remained unchanged over the period. The SO₂ emission factors for these fuels were used to derive the emissions of SO₂ from the sector for the period.

The impact of the proposed strategies to reduce SO₂ emissions nationally could then be implemented in this sector by altering the fuel mix and/or changing the emission factors to represent different sulphur content fuels.

The next stage in our methodology was to gather information on the costs of the proposed strategies to reduce the emissions of SO₂. The costs of the strategies involve many uncertainties which could significantly alter the results of the analysis. These include issues about the availability of certain fuels and the expected price differentials between fuel types over the period.

To make comparisons easier we assume that the strategies can all begin in 1993. The cost of the three national strategies, which aim to comply with the Helsinki Protocol, are imposed on the ESB. These abatement costs will not generate any additional revenue for the ESB so electricity prices need to increase to recoup the additional costs. These additional expenditures impact on economic activity through various mechanisms such as increases in energy prices, increases in imports, changes in private sector expenditure and changes in the exchequer's financing needs. As economic activity adjusts so too will the demand for energy and the SO₂ emissions in the economy.

To quantify the impact of the direct transfer of funds from Ireland to Eastern Europe, information was needed on the relative cost of installing desulphurisation in both areas. The amount transferred would need to cover the cost of achieving the same impact on annual European SO₂ depositions in Eastern Europe as would the use of desulphurisation equipment in Ireland. The cost of the transfer is assumed to be met by taxes on energy use in Ireland.

This strategy would have implications for the exchequer borrowing requirement. If taxes are raised which only pay for the direct cost of the transfer then the exchequer borrowing requirement will increase. This occurs because the dampened economic activity, due to the energy taxes, will reduce other tax revenues and increase welfare expenditures. We have included a scenario on this strategy where taxes are raised to cover the direct cost of the transfer to Eastern Europe as well as keeping a neutral position for the exchequer finances.

Comparison is made between the strategies to determine the "least cost" solution to achieving the objective of reducing European SO₂ depositions. There are two types of costs used in the analysis, the direct costs of each strategy to reduce emissions and the indirect costs to the economy from higher energy prices. These indirect costs are captured, using the ESRI medium-term model, by examining the macroeconomic effects of each strategy.

Gross National Product (GNP), albeit inadequate for environmental issues, is used as a measure of the costs in terms of economic welfare. The cost of each strategy on the economy is assessed by discounting future reductions in GNP by a social discount rate. This discount rate is assumed to be 5%, which is the forecasted expected real interest rate over the period. The cost in terms of GNP is taken over the period 1993-2002, because ten years is the expected lifespan of the desulphurisation investment.

The costs are compared in terms of European SO₂ deposition avoided. The direct costs are expressed in current values while the indirect costs are in constant 1985 prices.

Ireland's decision to accede to the Helsinki Protocol should be considered to be an unilateral action, in terms of its economic impact. This is because the UK, our main trading partner, has declined to accede to the protocol. However the mandatory LCP directive is even more stringent on other EC countries, including UK, so the competitiveness losses for Ireland will be similar to those from a multilateral action.

We examine the impacts for the economy of the benefits of taking multilateral action, along with our main trading partners, in comparison with taking unilateral action for each of the three domestic strategies. There are competitiveness losses from unilateral action, as domestic production costs rise relative to our trading partners.

The distinction between these scenarios is generated by removing the loss in competitiveness for the economy by keeping cost of production in line with that of our main trading partners in the multilateral case.

The impact of keeping the effect on the exchequer's borrowing requirement neutral is examined using the direct transfer to Eastern Europe strategy.

5. STRATEGIES FOR SO₂ REDUCTION

This section presents the direct costs of three proposed domestic strategies to meet the Helsinki target for Ireland. The necessary direct cost of the transfer to Eastern Europe is also evaluated. The costs used are not definitive but are the best estimates available for our analysis. Present price differentials are assumed to hold over the decade. However in the multilateral case these might not hold if other countries use similar strategies because price premiums may appear on low sulphur fuels.

5.1 Desulphurisation Equipment

This strategy involves the ESB installing desulphurisation equipment or "scrubbers" at three coal fired units at Moneypoint. The technical process used is flue gas desulphurisation which it is estimated can remove between 70%-90% of the sulphur content but it reduces the efficiency of the plant by 1 or 2%. The cost of the equipment is estimated to be £150m plus an additional once-off £30m in extra fuel costs during installation. The extra operating cost is expected to be £15m each year with the expected economic life of the equipment being 10 years.

It is assumed that the entire set up and installation costs of £180m is borrowed abroad by the ESB at a 10% rate of interest, so that domestic interest rates are unaffected by the installation. The repayments are assumed to be made in equal amounts over 10 years. This strategy costs the ESB approximately £44m p.a. without generating any additional revenue. In order to raise the revenue to finance the investment, electricity prices would need to increase by about 4% p.a. above the central forecast. In the year of installation about 75% of the increase in investment is on machinery and equipment, which is mainly imported. The remainder of the investment is in the building and construction sector.

5.2 Use of Low Sulphur Coal

This strategy involves the ESB using only coal with a sulphur content of 1%. This requires no additional capital investment. It involves a direct substitution for existing coal stocks with premium priced low sulphur coals. The sulphur content of existing stocks vary, with some use of low sulphur coal already taking place. We assume that there is a combination of 1% and 2% sulphur coals used with a price premium of \$10 per tonne on the

1% sulphur coal which is assumed to remain constant over the period. This is a tentative assumption about the price differential which could change significantly over the period depending on changes in market conditions.

The impact of changing entirely to 1% sulphur coal is to increase the ESB's fuel costs between £9-11m p.a., which also increases the country's import bill. In order to raise revenue to meet this additional cost electricity prices would need to increase by about 1% p.a. above the central forecast.

5.3 Combining Natural Gas and Low Sulphur Coal

This strategy involves the ESB making greater use of their existing natural gas generating capacity. The use of natural gas is then supplemented with sufficient use of low sulphur coal to meet the Helsinki target level of 75,000 tonnes of SO₂ emissions. The use of natural gas alone would not be adequate to achieve this target without additional investment in a number of gas powered generating stations.

An important issue that influences the feasibility of this strategy is the availability of natural gas in adequate quantities for electricity generation. The ESB currently receives its supply of natural gas from Bord Gais Eireann (BGE) which sources its gas domestically at the Kinsale and Ballycotton gasfields. However these will be depleted at the end of the decade. There are plans, currently at an advanced stage, to construct an under-water gas interconnector with the UK to gain access to supplies of North Sea gas. This interconnector is expected to be operational by the end of 1994.

For consistency we assume that a reliable supply of natural gas will be available from 1993 onwards. The price at which the gas is imported over the period is very difficult to forecast but we have assumed that it will increase in line with petroleum products with a once off jump of 35% in 1993 to reflect higher UK prices. Natural gas emits no SO₂ in energy use so price premiums may emerge over the period reflecting increased demand due to its environmental advantages. However some commentators suggest that gas supply will increase substantially at the end of the decade from sources such as Norway so that prices may not rise substantially in the long term.

The cost of the pipeline is anticipated to be about £240m which we have assumed to be financed by BGE with 33% part funding by the EC under the REGEN Programme. The operating costs are anticipated to be between 1-2% p.a, with investment repayments taking place over 30 years. We assumed that domestic reserves will be adequate to cover the users in other sectors for the period so that the ESB initially becomes the marginal user of the gas from the interconnector. The annual costs of the pipeline we estimate to be about £16m. These

costs are recouped by an increase in the imported price of natural gas to the ESB of approximately 3p a therm. The gas is substituted for oil, the ESB's marginal fuel, giving rise to an additional increase in fuel costs of about £2.5m p.a. over the latter years of the decade.

Increasing quantities of low sulphur coal are used along with the natural gas to keep close to the Helsinki target over the period. The annual cost of this low sulphur coal increases from £1m p.a initially to £11m p.a. by the end of the decade. The combined fuel cost for the ESB rises to about £14m p.a by the end of the period which requires a rise of over 1% p.a on electricity prices above the central forecast.

5.4 Transfer to Eastern Europe

This strategy involves a direct transfer of funds from Ireland to Eastern Europe to install flue gas desulphurisation at their coal fired power plants. Estimates of the cost of installing desulphurisation vary considerably. Using a valuation from one source for East Germany, the cost per tonne of SO₂ removed is estimated to be £225 p.a (D.Newbury, *Acid Rain*, Economic Policy, 11, October 1990). The use of desulphurisation in Ireland leads to reductions in SO₂ emissions of 54,000 tonnes p.a. on average from the benchmark over the period 1993 - 2000. This leads to a reduction in European SO₂ depositions of about 17,000 tonnes p.a., (i.e. $54,000 * 0.31$). To achieve the same impact on acid rain in Europe, emissions in Eastern Europe would need to be reduced by about 29,000 tonnes p.a., (i.e. $\frac{17,000}{0.58}$). The cost of the transfer to achieve this impact would be about £6.5m p.a which could be raised by taxes on energy. This compares with the direct cost of £44m p.a for the same environmental impact of the ESB using desulphurisation equipment.

The cost of a direct transfer each year of £6.5m to finance abatement investment in Eastern Europe would also seem to require less in direct costs than the other proposed strategies. The direct cost of low sulphur coal use is about £10m p.a and the combined use of natural gas and low sulphur coal is about £12m p.a., see Table 5. These costs are the direct costs of the abatement investment. However the macroeconomic and environmental implications of the strategies differ and these are considered in the next section.

TABLE 5: Direct Costs of SO₂ Reduction Strategies

<i>Strategy</i>	<i>Direct Cost £m p.a.</i>
Desulphurisation	44
Low Sulphur Coal	10
Combined Gas & Coal	12
Transfer	6.5

TABLE 6: Benchmark SO₂ Emissions For Ireland 1987 - 2000

(Thousand Of Tonnes per Year)

Sector	1987	1990	1993	1994	1995	1996	1997	1998	1999	2000
Domestic	28.6	29.1	30.2	30.4	30.7	31.1	31.4	31.8	32.2	32.6
Industrial	40.2	47.9	52.2	53.4	54.4	55.2	55.8	56.1	56.5	56.7
Transport	7.3	7.7	8.1	8.1	8.2	8.2	8.3	8.4	8.4	8.5
Power Generation	95.0	100.0	105.5	109.3	114.3	119.0	124.4	130.1	136.1	142.3
National	171.2	184.7	195.9	201.2	207.7	213.4	219.9	226.4	233.2	240.0

TABLE 7: National SO₂ Emissions from the Desulphurisation Strategy

(Thousand Of Tonnes per Year)

Sector	1987	1990	1993	1994	1995	1996	1997	1998	1999	2000
Domestic	28.6	29.1	29.9	30.2	30.6	30.9	31.2	31.6	32.0	32.4
Industrial	40.2	47.9	51.6	53.0	54.0	54.8	55.4	55.7	56.0	56.2
Transport	7.3	7.7	7.9	8.0	8.1	8.1	8.2	8.3	8.3	8.4
Power Generation	95.0	100.0	58.5	60.8	64.1	66.8	70.0	73.5	77.0	80.8
National	171.2	184.7	147.9	152.0	156.7	160.6	164.8	169.0	173.3	177.7

6. IMPACTS OF THE SO₂ REDUCTION STRATEGIES

This section examines the impact of the SO₂ reduction strategies on the macroeconomic performance of the Irish economy and on the national emissions of SO₂. The macroeconomic impacts are examined in terms of the differences from the central forecast. The impacts on the environment are considered in terms of attaining the agreed Helsinki target SO₂ emission level for the power generation sector of 75,000 tonnes and the overall Helsinki target for the country of 157,000 tonnes by 1993. The ESB also needs to remain within the Large Combustion Plant directive ceiling of 124,000 tonnes in 1993.

The pattern of economic growth in the central forecast would increase the national emissions of SO₂ by 40% of the 1987 levels by the year 2000, see Table 6. This table shows the impact of economic growth on national SO₂ emissions if there was no environmental policy decision to reduce SO₂ emissions.

National emissions in 1993 would overshoot the target by 25% and the power generation sector would overshoot its agreed target of 75,000 tonnes by 41% if no preventive action were taken. The power generation sector would be comfortably within the mandatory target of the EC Large Combustion Plant directive of 124,000 tonnes by 1993 but by the end of the decade this target would have been missed by 15%. The demand for energy in the economy grows on average at about 2% p.a. over the decade while the demand for electricity grows at about 3.5% p.a. up to 1997 and by 4.5% p.a. thereafter.

6.1 Desulphurisation Equipment

The use of the desulphurisation equipment by the ESB is assumed to have a removal efficiency of 70% and to reduce operating efficiency by 2%. It would bring the power generation sector's 1993 emission level to 58,500 tonnes well below the Helsinki target of 75,000 tonnes, see Table 8. It would also reduce the national emissions down to 147,900 tonnes, this would be below the Helsinki target of 157,000 tonnes. This national

emission threshold would be broken by 1996 but by the end of the decade the national emissions would still be 20% lower than the 1980 levels. The SO₂ emission reduction, compared to the benchmark emissions, would on average be about 54,000 tonnes p.a. This level of emission reduction would give rise to an annual reduction of about 17,000 tonnes of SO₂ deposition in Europe with a direct cost to the ESB of £2590 p.a. per tonne of deposition avoided.

TABLE 8: Macroeconomic Impact of the Desulphurisation Strategy

Unilateral Versus Multilateral Action

Unilateral Action	Difference from the Central Forecast			
	1993 £m	1995 £m	1997 £m	2000 £m
Balance Of Payments	-145	10.5	29.5	31
Exchequer Borrowing Requirement	15	-1.3	-3	6
Gross National Product	49	-7	-16	-13
Net Present Value Of GNP 1993-2002	-37.3			

Multilateral Action	Difference from the Central Forecast			
	1993 £m	1995 £m	1997 £m	2000 £m
Balance Of Payments	-143	8.8	27.3	33.3
Exchequer Borrowing Requirement	16.7	0.8	-0.2	8.5
Gross National Product	53	-2.5	-10.4	-8.6
Net Present Value Of GNP 1993-2002	-1.6			

The transmission effects through the economy would be similar in both the unilateral and multilateral cases, however the beneficial impacts for the economy would be larger in the multilateral case, see Table 8. In the unilateral case impact of the ESB investing in desulphurisation equipment at Moneypoint commencing

ing in 1993 would give an initial once-off boost to investment demand. The output of the building and construction sector would rise which would give a temporary increase in employment in 1993. The prices and wages in the economy would be increased initially. The balance of payments would disimprove initially by about £145m reflecting the impact of the high import content of the investment along with the once-off imports of additional fuel of about £30m. The exchequer borrowing requirement would improve initially due to higher tax receipts from increased activity.

The result of the entire investment taking place in 1993 would be to increase GNP by about £49m compared to the central forecast. The positive stimulus to the economy would be temporary as the annual increase in electricity prices would push up prices and wages, dampening economic activity throughout the remainder of the period. GNP would fall by about £12m p.a on average over the period. The balance of payments would recover as the demand for imports would be reduced substantially, due to the slowdown in economic activity.

The effect of higher domestic prices and wages as a result of the strategy would increase the cost of domestic output relative to foreign output leading to a loss in Irish competitiveness. This loss in competitiveness would be as a direct result of acting unilaterally.

In the multilateral case the initial stimulus in economic activity would be greater in 1993 with investment increased by £132m, the exchequer borrowing requirement would be improved by £17m, the balance of payments would be down by £144m and GNP would be increased initially by £53m. Prices and wages would increase over the period but economic activity would slow down. The balance of payments would recover much faster than in the unilateral case, imports would be reduced but exports would not be as heavily affected due to a loss in competitiveness so the trade balance would recover much quicker. The annual loss in economic activity would also be reduced due to the avoidance of the competitiveness loss, with GNP declining by about £10m p.a. on average.

To determine the net position in terms of economic welfare we used the orthodox measure of GNP, discounting its future reductions, using a 5% social discount rate, against its initial increase. This would put a net present value on the loss in economic growth of installing desulphurisation equipment over the ten year period 1993 - 2002 in the unilateral case at £37.3m. Combining the larger initial boost to GNP and dis-

counting the smaller annual losses, the net present value of the loss in GNP would be £1.6m in the multilateral case. The benefits in terms of sustainable economic growth are clearly enhanced by taking international environmental action multilaterally rather than unilaterally.

6.2 Use of Low Sulphur Coal

The use by the ESB of coal with a 1% sulphur content is much less effective than use of the other strategies in achieving improvements in SO₂ reductions. The strategy would be successful in keeping the ESB quite comfortably within the Large Combustion Plant ceiling throughout the period but it would not reach the ESB's Helsinki target for 1993, see Table 9. The national Helsinki emission target would not met, There would be an 8% overshoot in 1993 and a 30% overshoot by 2000. The reduction in SO₂ emission compared with the benchmark emissions would be about 30,000 tonnes p.a. on average. This level of emissions would give rise to a reduction of about 9,000 tonnes of SO₂ deposition in Europe each year with a direct cost to the ESB of £1110 p.a. per tonne of deposition avoided.

The impact of the ESB using low sulphur coal to achieve SO₂ emission reductions involves no capital investment but increases the cost of electricity generation. The additional costs are recouped through higher prices each year. However the magnitudes are small such that the impact on the economy is quite insignificant. Using the more expensive low sulphur coal would increase the price of fuel imports and reduce the level of activity in the economy.

The rising domestic price level, albeit quite small, along with rising wage levels, would erode the country's competitiveness with output costs increasing such that the balance of payments would disimprove over the period. The reduction in GNP would rise each year to about £4m p.a by the end of the period. The level of consumption and investment from the private sector also would diminish throughout the period. The exchequer borrowing requirement would be marginally higher by about £5m p.a, due to diminished tax receipts brought about by the drop in economic activity.

The net present value of the loss in GNP for the economy from using low sulphur coal over the ten years acting unilaterally would be about £18.5m compared with £5.5m from a multilateral action.

TABLE 9: National SO₂ Emissions from the Low Sulphur Coal Strategy
(Thousand Of Tonnes per Year)

Sector	1987	1990	1993	1994	1995	1996	1997	1998	1999	2000
Domestic	28.6	29.1	30.1	30.4	30.7	31.0	31.4	31.7	32.1	32.5
Industrial	40.2	47.9	52.1	53.3	54.3	55.1	55.7	56.0	56.4	56.5
Transport	7.3	7.7	8.1	8.1	8.2	8.2	8.3	8.3	8.4	8.5
Power Generation	95.0	100.0	79.2	82.1	86.2	89.8	94.0	98.4	103.0	107.8
National	171.2	184.7	169.5	173.9	179.3	184.0	189.3	194.5	199.9	205.3

TABLE 10: National SO₂ Emissions from Combined Gas and Coal Strategy
(Thousand Of Tonnes per Year)

Sector	1987	1990	1993	1994	1995	1996	1997	1998	1999	2000
Domestic	28.6	29.1	30.1	30.4	30.7	31.0	31.4	31.7	32.1	32.5
Industrial	40.2	47.9	52.1	53.3	54.3	55.1	55.7	56.0	56.3	56.5
Transport	7.3	7.7	8.1	8.1	8.2	8.2	8.3	8.3	8.4	8.5
Power Generation	95.0	100.0	75.4	74.0	76.6	76.7	77.5	78.3	79.1	80.0
National	171.2	184.7	165.7	165.7	169.7	171.0	172.8	174.4	176.0	177.4

6.3 Combined Natural Gas and Low Sulphur Coal

This strategy involves the ESB using as much natural gas as it can using existing generation capacity, along with sufficient 1% sulphur content coal to keep the ESB close to its Helsinki target of 75,000 over the period. By 1997 all the coal use has been switched to 1% sulphur content so that the emissions in the power generation sector would begin to rise from around 75,000 tonnes in 1993 to about 80,000 tonnes by the end of the decade. However the national Helsinki target, in Table 10, would not met by this strategy either with emissions in 1993 at 165,000 tonnes increasing to 177,400 by the end of the decade.

The reduction in SO₂ emissions compared with the benchmark emissions from this strategy would be about 45,000 tonnes p.a. on average. This would give rise to a reduction of about 14,000 tonnes of European SO₂ deposition each year. The direct cost to the ESB is £860 p.a. per tonne of deposition avoided. On the basis of the tentative assumptions used in this analysis this strategy is the "least cost" solution for the ESB meeting the Helsinki target.

This strategy involves no capital investment so there is no temporary stimulus for the economy as under the desulphurisation strategy. The increased fuel costs have similar impacts on the economy as in the use of low sulphur coal strategy. Competitiveness would be eroded by higher output costs due to rising prices and wages. The exchequer borrowing requirement would increase by about £4.5m p.a. by the end of the decade. The balance of payments would disimprove over the period and the loss in GNP would be about £4.5m p.a. by the end of the decade.

The net present value of the loss in GNP from the combined use of natural gas and low sulphur coal for electricity generation over ten years would be £19.6m by acting unilaterally compared to £5.4m in the multi-lateral case.

6.4 Transfer to Eastern Europe

This strategy assumes that there is international co-operation to deal with the acid rain problem. Abatement investment takes place at sources which have the greatest impact on reducing European SO₂ depositions. In this case Ireland makes a direct transfer of about £6.5m p.a. to Eastern Europe. The government is assumed to raise taxes on energy by just enough to pay for the transfer. This strategy would lead to a steady deterioration in the balance of payments and the exchequer borrowing requirement would increase over the period, see Table 11. This strategy is directly comparable with the previous strategies analysed

because these have similar implications for the exchequer borrowing requirement and the balance of payments.

TABLE 11: Macroeconomic Impact of Direct Transfer of Funds to Eastern Europe

Direct Transfer	Difference from the Central Forecast			
	1993 £m	1995 £m	1997 £m	2000 £m
Balance Of Payments	-3.8	-2.8	-2.1	-2.5
Exchequer Borrowing Requirement	-1.5	-3.7	-4	-4.7
Gross National Product	-2.4	-3.6	-4.5	-5.2
Net Present Value Of GNP 1993-2002	-32.5			

Direct Transfer Exchequer Neutral Position	Difference from the Central Forecast			
	1993 £m	1995 £m	1997 £m	2000 £m
Balance Of Payments	-2.1	-0.02	1.6	2.5
Exchequer Borrowing Requirement	1.3	-1.3	0	0
Gross National Product	-3.5	-4.8	-6	-6.3
Net Present Value Of GNP 1993-2002	-42.0			

The tax increase to fund this transfer each year would dampen economic activity. Both personal consumption and investment would decline over the period. The exchequer borrowing requirement would increase by about £4m p.a. The balance of payments would disimprove by about £3m p.a. The reduction in economic activity, reflected by the decline in GNP, would be about £5.5m p.a. by the end of the decade.

The net present value of the loss in GNP for the economy from this annual transfer to Eastern Europe over the ten years would be £32.5m. This loss in GNP from transferring funds to Eastern Europe is lower than the loss of £37.3m in the domestic desulphurisation strategy for the same impact on European depositions.

To keep the effect of this strategy neutral for the exchequer borrowing requirement the government would need to raise a larger amount of taxation. The tax rate used to raise the funds for the transfer would need to be about 50% higher to achieve this neutral effect. This policy would be more deflationary for economic activity, see Table 11, due to the higher taxes. There would also have a neutral impact for the balance

of payments. The net present value of the loss in GNP over the ten years would be £42m. This is higher than the £32.5m when there is no neutralising of the exchequer position.

This strategy reduces emissions in Eastern Europe by about 29,000 tonnes to achieve reduce European SO₂ depositions by 17,000.

6.5 Comparison of Strategies

All of the proposed strategies to implement the policy to reduce acid rain would have direct effects on the balance of payments and the exchequer borrowing requirement. It is important to emphasise that these impacts cannot be endured by the economy over a longer period. Environmental policy must have a neutral effect for the exchequer's finances so it can be sustainable in the long term. All environmental policy must be self-financing from the exchequer's viewpoint. On the grounds of equity it should be financed by those whose activities cause the pollution, the "polluter pays principle". The government should raise sufficient taxes on these activities to meet the direct costs of the strategy as well as ensuring that there is no deterioration in the balance of payments or in the exchequer borrowing requirement.

The objective of the policy to reduce national SO₂ emissions has been taken to be the reduction of acid rain in Europe. Comparison is made between the strategies in terms of the direct cost per tonne of European SO₂ deposition avoided. The direct costs of each strategy are given in Table 12 below

TABLE 12: Direct Cost Per Tonne of European SO₂ Depositions

Strategy	Reduction In Irish Emissions Per Annum ('000s Tonnes)	Reduction in European Deposition Per Annum ('000s Tonnes)	Direct Cost Per Tonne Of European Deposition (£)
Desulphurisation	54	17	2590
Low Sulphur Coal	30	9	1110
Combined Gas And Coal	45	14	860
Transfer	0	17	390

This shows that in terms of direct cost that the combined use of natural gas and low sulphur coal would be the "least cost" strategy for the Irish economy to meet the Helsinki targets. However the strategy of transferring funds to Eastern Europe would cut the direct cost per tonne of European SO₂ deposited by over half compared to this combined strategy. The direct cost per tonne of SO₂ deposition removed are substantially lower in Eastern Europe compared with the three strategies based on reducing Irish emissions of SO₂.

The transfer made to Eastern Europe is intended to achieve the same impact on European depositions as would the use of desulphurisation in Ireland. The value of the transfer needed to achieve the same impact on European depositions as would the use in Ireland of the low sulphur coal strategy is £3.5m p.a. and for the combined strategy is £5.4m p.a, see Table 13. These transfers would be less than the direct costs for the ESB of £10m p.a and £12m p.a, see Table 5, respectively for these strategies.

TABLE 13: Required Transfers To Eastern Europe

Strategy	Reduction in Eastern European Emissions Per Annum ('000s Tonnes)	Reduction in European Depositions Per Annum ('000s Tonnes)	Transfer Cost Per Annum (£)
Desulphurisation	29	17	6.5
Low Sulphur Coal	16	9	3.5
Combined Gas And Coal	24	14	5.4

The cost in terms of economic welfare of these strategies for Ireland can be measured by the estimated net present value of the reduction in GNP over the total reduction in European SO₂ deposits for the ten year period 1993-2002. These costs for a unilateral action are presented in Table 14 below.

TABLE 14: Costs in Terms of Lost GNP from Unilateral Action 1993-2002

Strategy	Reduction In European Depositions ('000s Tonnes)	Cost of Lost GNP (£m)	Cost of GNP per Tonne Of European Deposit (£)
Desulphurisation	170	37.3	220
Low Sulphur Coal	90	18.6	210
Combined Gas And Coal	140	19.9	140
Transfer	170	32.5	190

The combined use of natural gas and low sulphur fuel by the ESB would appear to be the "least cost" method, in terms of lost GNP per tonne of European SO₂ deposited, of achieving the Helsinki targets for the Irish economy in the unilateral case.

The efficiency of transferring funds to Eastern Europe in terms of lost Irish GNP is £190 per tonne of European SO₂ deposition compared with £220 from the use of desulphurisation by the ESB. The costs of transferring of funds to Eastern Europe is only directly comparable with Ireland in the use of desulphurisation equipment. It may well be the case that the application of the other strategies in Eastern Europe is more cost efficient but we have insufficient information on these costs to provide such comparisons.

TABLE 15: Costs in Terms of Lost GNP from Multilateral Action 1993-2002

Strategy	Reduction In European Depositions ('000s Tonnes)	Cost of Lost GNP (£m)	Cost of GNP per Tonne Of European Deposit (£)
Desulphurisation	170	1.6	10
Low Sulphur Coal	90	5.5	60
Combined Gas And Coal	140	5.4	40
Transfer	170	32.2	190

The use of desulphurisation equipment by the ESB appears to be the "least cost" method, in terms of lost GNP per tonne of European SO₂ deposited, of achieving the Helsinki targets for the Irish economy in the case of multilateral action. The choice of "least cost" strategy in terms of lost economic welfare depends on whether the action is taken multilaterally or unilaterally.

7. CONCLUSIONS

By taking the policy decision to reduce SO₂ emissions as a case study, this article highlights some of the important issues involved with environmental policy. The environmental reasons why Ireland acceded to the Helsinki protocol are not clear. We have suggested that the protocol, as it stands, is not the most effective way to achieve the objective of reducing acid rain in Europe. The proposed strategies to achieve the Helsinki targets may not be the most cost efficient ways of meeting the underlying environmental objective of the government when it acceded to the protocol.

Internationally there has been an emphasis on regulation rather than on price instruments. The regulatory approach has been mainly based on the use of quotas to limit discharges of pollutants. However there is increasing pressure to make use of price measures to deal with environmental problems. The use of carbon taxes to deal with the problem of CO₂ adding to the disputed "Greenhouse Effect" is strongly advocated by many countries. If environmental policies are to be implemented equitably the distributional consequences of this type of price measure will need to be fully anticipated before any agreements are entered into.

The analysis shows that, given the emphasis on the power generation sector, the national SO₂ emission targets could only be met if the strategy of installing desulphurisation equipment is used on coal powered generation stations. This strategy involves very significant costs for electricity generation and the same impacts for the European environment could be achieved at much lower costs to the Irish economy by a direct transfer of funds to Eastern Europe.

The strategy which involves combining natural gas and low sulphur coal in electricity generation is the "least cost" solution to the economy for national SO₂ reductions in the case of unilateral action. However, while it allows the ESB to achieve its Helsinki target,

the national target would not be met by this strategy alone. The use of low sulphur coal alone in electricity generation is unlikely to achieve any of the targets under the Helsinki Protocol but it would allow the ESB to achieve its target under the Large Combustion Plant directive.

The costs to the economy are significantly reduced by engaging in multilateral environmental action with our main trading partners rather than taking unilateral actions, because the latter action involves much larger losses in national competitiveness. The use of desulphurisation becomes the "least cost" solution to the economy under multilateral action. This strategy would meet Ireland's and the ESB's Helsinki targets. The methodology used in the analysis highlights the importance of the assumptions made about external factors in determining "least cost" solutions.

Environmental actions will only be sustainable in the long term if they have neutral implications for the exchequer's finances. However the deflationary effects of exchequer neutral environmental policy will involve much greater losses in economic growth than in the cases where no neutralising of exchequer borrowing requirement occurs.

The conclusions that can be drawn from this case study for Irish policy makers is that environmental objectives need to be clearly specified and co-ordinated before commitments to take action are made. The implementation of policies to achieve these objectives needs to be done efficiently at the least cost to the economy rather than merely identifying the least expenditure cost solution. These policy options should allow for the innovative action of direct transfers to other countries if it proves to be the most efficient solution. The consequences of unilateral actions, particularly without corresponding action by our main trading partners, and the distortionary effects of emphasis placed on particular sectors to achieve national objectives, need to be fully considered before decisions are made in the future on how environmental objectives are to be achieved.

On this occasion the costs for the economy of the decision to accede to the Helsinki Protocol are likely to be small. However many important issues have been ignored in making this decision. If this was to set a precedent for future environmental decisions the costs for the economy could be excessive.

ISSUES IN THE ANALYSIS OF IRISH UNEMPLOYMENT¹

by Frank Barry

ABSTRACT

This paper charts the development of economists' views on the determinants of Irish unemployment. A Keynesian demand-side view influenced government policy in the late 1970s but the failure of these policies over the longer term has led some to deny the existence of any conventional demand-side effects. This conclusion, it is argued here, is unwarranted. Nevertheless, the aggregate-supply side is the engine of growth. Recognition of this has begun to focus attention on the sectoral structure of production as a crucial determinant of employment and unemployment performance. The paper argues that the impact of structural change in the economy on unemployment needs to be researched more fully.

1 THE FOCUS OF THE STUDY

The unemployment rate is arguably the single most important barometer of the economy's performance, because unemployment has such far-reaching social ramifications. Economists have devoted an increasing amount of attention in recent years to analysing the causes of Ireland's poor experience in this regard, and the present paper presents a partisan summary and review of this research.

The focus here is on how unemployment emerges as an outcome of the functioning of the entire macroeconomy. This represents a different emphasis from that of Geary's (1988) literature survey which concentrates on the microeconomics of individual's behaviour within "the labour market", and of the studies by Newell and Symons (1990) and Walsh (1987). These papers ignore the economy's sectoral structure as a determinant of the overall response of unemployment to such aggregate shocks as changes in government policy and the world environment, and increasingly free trade.

This study therefore focuses its attention on the demand for labour, which drives employment, and for the most part leaves aside issues of labour supply such as the determinants of the participation rate and the emigration decision. Labour supply is clearly not the important constraint at present and these issues are in any case reasonably well understood.

The paper proceeds therefore by looking at the aggregate-demand and aggregate-supply factors that affected employment since the mid-1970s, and then, in more speculative mode, questions whether there are issues of industrial structure as yet unexplored which might help us understand why unemployment has remained above the European average throughout the whole period under discussion.

The analysis begins by looking at the demand side of the economy, focusing in particular on the extent to which government spending influences total employment. The Keynesian conventional wisdom of policy-makers worldwide in the 1960s had posited a positive relationship between the two, and these ideas influenced government policy in Ireland in the mid-to-late 1970s when budget deficits were increased in an attempt to mitigate the employment effects of the OPEC oil shocks.

To what extent can such policies protect employment, even in the short term? This is now a matter of considerable controversy. Newell and Symons (1990), in a study funded by the National Economic and Social Council, found no evidence that the policies had any such effect. McAleese (1990), in arguing that the post-1987 fiscal contraction was an important factor in the economic recovery of 1987-90, goes much further; the implication of his argument is that fiscal multipliers are negative.

These studies would suggest that there is no validity to the old Keynesian textbook notion that government spending boosts aggregate demand and employment in the short run. This is not the right lesson to learn from the period, it is argued here. These demand-side effects can be identified, but they have been counterbalanced over time by the negative supply-side consequences of having to finance fiscal spending.

One variant of this case was made in the study by Barry and Bradley (1991). The supply-side mechanisms that that study focuses upon in explaining why fiscal expansion has had only short-lived effects on unemployment are twofold; the impact on wage demands (and migration) of a tightened labour market, and the cost impact on firms of higher taxation, both directly and through increased wage demands as workers struggle to protect take-home pay.

These mechanisms are explored in the section on aggregate supply, which also discusses how industrial structure influences the ability of firms to meet these cost increases.

2 WORLD ECONOMIC ENVIRONMENT: BACKGROUND TO IRELAND'S UNEMPLOYMENT

The first point to note about Irish unemployment, and indeed the inflation rate and other macroeconomic

¹ The author is grateful to seminar participants at UCG and the University of Limerick, and to John Bradley (ESRI), Joe Durkan (UCD), Deirdre McHugh (IDA), Sara Moore (U of L) and the ESRI staff for helpful discussions. The opinions stated are the author's responsibility alone.

variables, is the extent to which they are externally determined; we need look for domestic causes of our performance only to the extent to which it deviates from that of our trading partners.

The influence of the external environment is illustrated graphically in Figures 1 and 2 which depict the inflation and unemployment experiences of the OECD and Irish economies since the 1960s. According to Bruno and Sachs (1985), who analyse the OECD experience in detail, the movements over time in these variables can be understood as follows: the generally expansionary monetary and fiscal policies of the 1960s led to the falling unemployment and rising inflation of the period. A real wage push followed in the late 60's/early 70's due to the increased proportion of the workforce that had become unionised; this supply shock raised production costs and inflation, and priced labour out of employment, and another supply shock with much more dramatic consequences, the oil price increase of 1973/1974, followed soon afterwards.

Contractionary policies to reduce the oil-fuelled inflation raised unemployment, but wage moderation and a later relaxing of policy eased the journey from the mid-1970's. The next oil shock hit in 1979, and in the early 1980's further contractionary policies pushed us once again down to the south-east in the diagram.

Figure 1
OECD Inflation & Unemployment, 1961-89

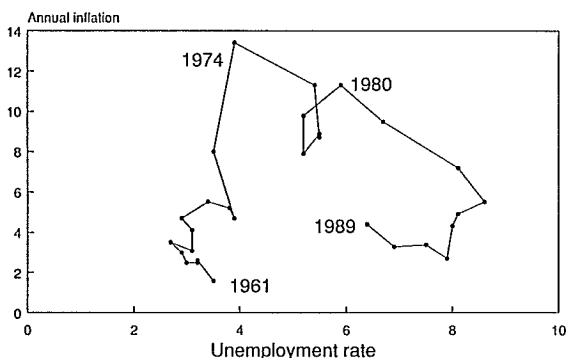


Figure 2
Irish Inflation & Unemployment, 1961-90

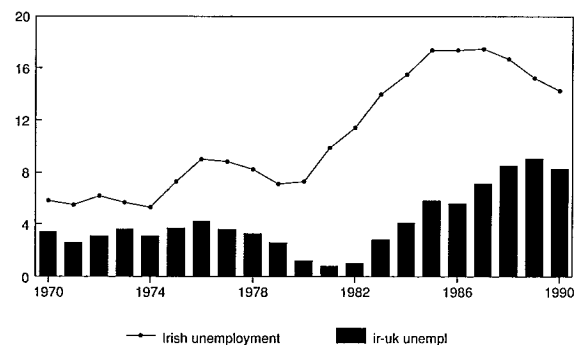


It comes as no surprise, of course, that the Irish experience should mirror the general OECD experience in many respects, as is apparent from Figure 2. The oil shocks hit our economy at the same time as they hit everywhere else; we can all accept that our inflation rate

is largely determined abroad; and it is clear that if our export markets go into recession, we will sink alongside them.

What mainly needs to be explained then is not the Irish unemployment experience per se, but rather how our unemployment rate has moved relative to our trading partners. The gap between Irish and UK unemployment is plotted in Figure 3. The timing of the narrowing and widening of this gap should give us strong clues as to the domestic variables that influence employment and unemployment; this is the main subject of the present paper.

Figure 3
Gap between Irish and UK Unemployment



3 THE ROLE OF DOMESTIC AGGREGATE DEMAND

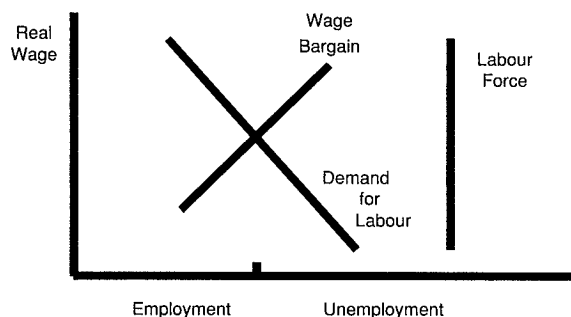
a) Identifying the Impact of Fiscal Stance

We see from Figure 3 that the gap between Irish and UK unemployment narrowed between 1976 and 1982, and then exploded. The gap between the Irish rate and the EC average also followed roughly this course. What clues does this provide as to the domestic forces playing a role in the story?

This discussion can be structured around the three very simplified relationships depicted in Figure 4. The vertical line represents the size of the labour force; the labour-demand function for the economy slopes downwards because reduced labour costs allow an expansion of employment; and the upward-sloping line depicts a wage relationship based on bargaining between workers and firms: a higher level of employment tightens the labour market and increases the power of unions to secure wage increases. Employment is determined at the intersection of the labour-demand and wage schedules, and unemployment is measured as the gap between this level and the total labour force.

In terms of this diagram, then, the reasonably good Irish performance relative to the EC and the UK in the 1976-82 period must have been due either to a gain in cost competitiveness (a rightward shift of the wage function relative to our trading partners), relatively slower growth of the Irish labour force (an inward shift of the labour-force function), or an expansion in labour demand in Ireland relative to elsewhere. Which of these factors was actually responsible for the events of the period? Not the first, because relative hourly earnings measured in a common currency reveal losses in Irish cost competitiveness at the time; not the second, because

Figure 4
The Labour Market



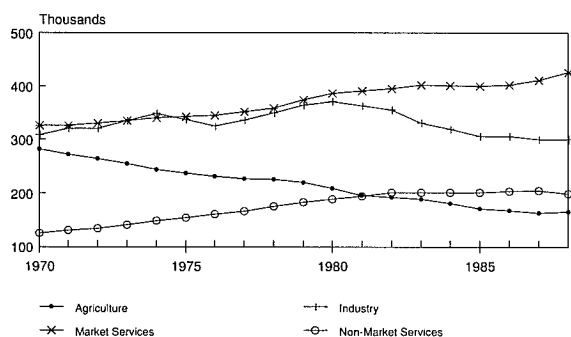
Irish labour force growth was greater than the average in our trading partners over the period; therefore the third. The only factor working in the direction required to provide an explanation was labour demand.

Where did this buoyancy in labour demand come from? One source was the continued inflow of foreign direct investment; employment in this sector of manufacturing peaked only in 1981 (c.f. Figure 7). The other source however was domestic demand, which propped up employment in marketed services, and, to a lesser extent, in Irish indigenous manufacturing (Figures 5 and 7).

To analyse the issue further we need to look in detail at one important component of domestic demand -the stance of fiscal policy.

One reflection of this stance is non-marketed services sector employment (comprising public administration, defence, health and education); this continued to rise until 1982 (Figure 5) and accounted for some three-quarters of total employment growth between 1970 and that date; it is therefore consistent with the timing we need to explain. It is obviously a very crude measure, however, which leads us to ask whether a better one exists.

Figure 5
Sectoral Employment Numbers, 1970-88



It has been accepted since the Keynesian/Monetarist debates of the 1960's that changes in the government budget deficit are inadequate as a measure of fiscal stance; this is so because tax take falls and social welfare expenditures increase automatically as the economy moves into recession, so that the overall deficit also

moves automatically. A more acceptable measure of the stance of fiscal policy focuses on the cyclically-adjusted (or structural) government budget deficit; this removes the effects of these automatic changes by measuring what the deficit would be, given tax and subsidy rates etc., were the economy at a high level of employment.

Data from Muller and Price (1984) show that in terms of this measure of fiscal stance Irish policy became strongly expansionary in 1975, dipped in 1976, became more expansionary thereafter until its peak in 1982, and then became progressively more contractionary. The same story applies when we consider the Irish stance relative to the UK and EC average (also in table 3 below), which is important since it is the relative unemployment experiences with which we are now concerned.

Table 1: Cyclically-adjusted Budget Deficits as % of GNP/GDP

	<i>Ireland</i>	<i>Ireland-EC average</i>	<i>Ireland-UK average</i>
1975	10.3	6.9	7.1
1976	5.7	2.8	2.3
1977	6.5	4.5	4.8
1978	9.2	6.0	5.4
1979	10.7	7.4	7.5
1980	11.7	9.2	10.6
1981	13.3	10.4	15.1
1982	14.3	12.1	17.6
1983	10.6	8.9	12.2
1984	9.1	8.1	11.1

Even the structural deficit is an inadequate measure in one crucial respect however. Rising government debt and/or higher interest rates mean that a growing proportion of any given deficit goes to debt-servicing, and less goes therefore to demand-stimulation through purchases of goods and services. This suggests, as Muller and Price recognise, that the underlying budget stance would more accurately be measured by structural deficits net of interest paid by government. The figures they give for this variable show much the same timing as those discussed above, but the proportionate drop in the years after 1982 is of course much greater, as more and more of the Irish deficit went on debt service.

A recent OECD publication, Chouraqui, Hagemann and Sartor (1990), contains data on budget and primary-budget balances, both cyclically adjusted, which shows that the stance of Irish fiscal policy has been even more contractionary over the course of the 1980's when this point about debt interest payments is taken into account. These are shown in Table 2 below.²

The timing of these changes in fiscal stance is clearly consistent with the movements in Irish unemployment relative to the UK and the EC. There are of course more formal tests of the relationship between the two, though opinion is divided over the relative validity of the two methodologies used to analyse this type of issue: the statistical and structural-model approaches.

2 Unfortunately, the series shown in Tables 1 and 2 are constructed differently and so are not directly comparable.

Table 2: Changes in Cyclically-adjusted Budget Surpluses (% of GNP/GDP)

	A	B
1979	-2.85	-2.70
1980	-2.61	-2.20
1981	-1.99	-0.81
1982	0.81	1.97
1983	4.68	4.53
1984	2.05	2.65
1985	-0.58	0.17
1986	1.86	1.73
1987	0.69	0.87
1988	6.71	5.45
1989	-1.37	-1.13

Note: Column A refers to the cyclically-adjusted budget surplus, and B to the primary cyclically-adjusted budget surplus [i.e. net of net interest payments].

The former is a simple test of how closely two series are related. It does not spell out the economic mechanisms presumed to lie behind the relationship, and, though rough and ready, its perceived advantage is precisely that it is not based on a plethora of assumptions about how the economy works; since it is not based on a formal economic model, however, critics warn against using its results to make assertions about cause and effect.

Brendan Walsh (1987), employing this approach, found that the structural budget surplus was statistically significant and of the right sign in his empirical equation of the determinants of unemployment, as the present analysis would suggest, concluding that "an increase in the Irish (structural) budget surplus increases the level of Irish unemployment for a given rate of EC unemployment". The magnitude of the effect he found to be small, however.

The present analysis suggests that the structural budget surplus net of interest payments would be a more desirable measure of fiscal stance however, and econometric tests reveal that this measure indeed shows a stronger effect of fiscal stance on unemployment as well as an improved ability to track the data.³

The simple statistical approach, then, suggests that there is validity to the Keynesian notion of a positive relationship between employment and fiscal stance, operating on the aggregate- demand side of the economy. As will be seen later, though, these gains are largely wiped away when account is taken of the supply side impact of the need to finance fiscal spending.

What of the alternative methodology that builds a multiple- equation structural model of the economy? A criticism levelled at this approach is that since any single equation in the system will contain errors, in the sense of not being able to track the data with complete accuracy, the interaction of all these errors may yield distorted results. The advantage of the approach, on the other hand, is that the model is clearly grounded in economic theory and identifies and estimates explicitly the mechanisms by which fiscal policies affect macro variables.

Two recent analyses of Irish unemployment have used the structural approach, and have come to different conclusions on the effects of fiscal spending. Newell and Symons (1990), on the basis of a three-equation model of the labour market as depicted in Figure 4, argue that changes in budget deficits operating on aggregate demand did not influence unemployment in the period they discuss, i.e. 1979-1986. This contradicts the results of the simple statistical approach already discussed; the analysis above, however, suggests that they used an inadequate measure of fiscal stance.

Several other weaknesses of the Newell and Symons analysis are identified by Barry and Bradley (1991) who use the ESRI medium- term model in their attempt to account for the rise in unemployment; this makes it unnecessary to use summary measures of fiscal stance because the mechanisms by which the various components of government spending, taxation, debt interest payments etc. influence unemployment are fully articulated.

Their results contradict those of Newell and Symons by identifying that the fiscal contraction of the 1980s did have important contractionary demand-side effects on unemployment, while the fiscal expansion of the 1970s brought the unemployment rate 2.5 percentage points down from what it would otherwise have been.

b) Elucidating Other Empirical Results

The discussion so far suggests the following conclusions; firstly, that the recent behaviour of the Irish unemployment rate (relative to the UK and the EC average) cannot be understood without reference to the changing stance of Irish fiscal policy, and secondly, that empirical identification of this relationship requires that careful use be made of measures of fiscal stance, if they are to be used at all.

These lessons elucidate the various empirical results of Bean, Layard and Nickell (1986), Newell and Symons (1990) and McAleese and McCarthy (1989).

Bean, Layard and Nickell (p.57) note that their own desired measure of fiscal impact would be some variant of the cyclically- adjusted budget deficit, but they do not adopt this approach because the measures are not available for some of the countries in their cross-country sample; instead, they employ a particular linear combination of various exogenous demand factors including government spending. This makes it impossible to isolate the impact of fiscal policy in their work.

The importance of taking government debt servicing into account in evaluating the stance of fiscal policy has been argued in the previous section. It is further highlighted by considering the results reported by Newell and Symons, and McAleese and McCarthy.

The former ascribe 15% of the rise in unemployment over the period 1979-86 to the impact on Ireland of UK demand shocks, and a further 23% to high real interest rates. How are these results to be interpreted, since UK real interest rates were in fact higher than those in Ireland during this period [Leddin and Walsh (1990), chapter 12] and the high real interest rates were presumably a

³ Details available from the author upon request.

major factor driving the UK demand shocks? In other words, why do high real interest rates seem to have had a much greater impact on the Irish economy than on the UK? The interpretation offered here, and surely an intuitively appealing one, is that the increased debt service payments meant that fiscal policy was much more contractionary than measures which ignore this would indicate.

The same conclusions can be drawn from the analysis of McAleese and McCarthy, who enumerate the various external shocks which hit the economy during the 1980's. The interest rate shock with which the economy had to contend rose from \$2.3m in 1981 to \$164.8m in 1982, and stood at \$186.8m in 1985. The size of the shock clearly depends not just on what happens the interest rate in a particular year, but also on the extent to which the economy has accumulated foreign debt.

To say that the contractionary fiscal stance has played a major role in the increased unemployment of the last decade is not, of course, to imply that it was unwarranted; nor is it to imply that long-term benefits will not follow. What it does argue is that swings in fiscal policy have large (Keynesian) demand-side effects as well as supply-side effects working in the opposite direction, as Bean, Layard and Nickell (1986) and Bruno and Sachs (1985), for example, have found for other "small open economies" such as Belgium and Denmark.

The quantification of these effects by Barry and Bradley suggests that the expansionary fiscal policies of the 1970's reduced unemployment by around 2.5 percentage points, while the contractionary policies of the 1980's raised unemployment by over 4 percentage points by 1987. The reason for the disproportionate size of the two effects was of course the fact that world interest rates jumped so dramatically and so unexpectedly in the early 1980s after the debt build-up by which the fiscal expansion had been financed was begun.

As the analysis here implies that the short-term effects of fiscal policy operate in the conventionally-expected direction, it suggests buoyant world demand as the major driving force behind the post-1987 recovery. This is in contrast to McAleese's (1990) suggestion of an "expansionary fiscal contraction".

4 THE ROLE OF AGGREGATE SUPPLY

a) Input Costs, Taxation and Labour Costs

i) Input Costs

The costs of non-labour inputs can influence unemployment by reducing the demand for labour and hence the equilibrium or "warranted" real wage, as happened with the oil price increases of the 1970's [See Bruno and Sachs (1985), Figures 2a.2 and 2a.3]

There is some evidence to suggest that the cost of several inputs into the production process rose faster in Ireland than elsewhere during the 1980's; see the 1984 report of the National Planning Board (p.162-165) on the cost of electricity, for example, and the NESD Strategy for Development (1986) on relative postal and telecommunications charges. McCarthy (1986) also provides details on Ireland's relatively high road haulage and insurance costs, although it is not clear what the trend is in these relative costs.

Restrictive practices and regulatory barriers to entry probably also hinder competition in areas such as law and banking, raising the costs to industry of these inputs (Planning Board, p.243).

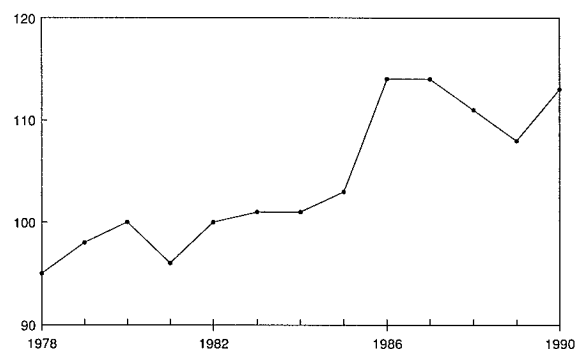
ii) Taxation and Labour Costs

Fiscal spending must ultimately be financed by taxation, and while the expansionary policies of the late 1970's and early 1980's raised employment initially, these demand-side effects were reversed over time through the supply-side mechanism of the tax-wedge. This section examines the extent to which wage demands and the tax-wedge may have contributed to unemployment.

The Central Bank publishes two series of importance for our discussion, relative hourly earnings and relative unit wage costs, both measured in a common currency. These are designed to measure movements in cost competitiveness relative to our trading partners. It has become more common in recent years to focus on the first measure because of the difficulty of interpreting movements in the second; a loss in cost-competitiveness that displaces the least efficient firms first will raise measured productivity and may thereby reduce measured unit costs;⁴ rapid productivity growth, furthermore, is confined to only a few manufacturing sectors.

Consider therefore the relative hourly earnings series, running from 1978 to 1989, which is depicted in Figure 6 below.

Figure 6
Irish relative labour costs



⁴ Note that this implies counter-cyclical movements in labour productivity, in contrast to the pro-cyclical movements encountered in the more highly developed economies. The traditional sector of Irish manufacturing in fact seems to exhibit the former and the more modern sector the latter. The explanation could possibly be that the modern sector is driven primarily by world demand fluctuations while traditional manufacturing is affected more strongly by movements in cost competitiveness.

The series reveals some loss in competitiveness over the period, which we would expect to be reflected in employment, although it seems likely that only sustained changes in wage trends would influence production and multinational location decisions.

There are three questions to be asked with reference to these movements in competitiveness: firstly, what accounts for the competitiveness loss?; secondly, what are the likely effects on employment?; and thirdly, in the light of the answer to the preceding question, can the Central Bank measure be regarded as adequate?

A major driving force behind the competitiveness loss has been the upward pressure on wage demands induced by the dramatic rise in the tax burden during the 1980's. The tax/GNP ratio grew faster in Ireland than in any other OECD country in this period [Walsh (1987b)] and, with large sectors of the Irish economy effectively not comprising part of the tax base, a major proportion of the increased tax has been in the form of income taxes. Clearly workers have passed part of this increase onto employers in the form of increased wage demands, but equally clearly have had to accept a substantial proportion of the burden themselves in the form of reduced real disposable income.

Taxation affects employment through the "tax wedge", which is the gap between the cost incurred by employers in hiring labour and the real purchasing power of the after-tax income received by employees. It is clear that the wedge rises whether it is payroll taxes, income taxes or indirect taxes that are increased; we would expect this to reduce both labour demand and labour supply, with the impact on unemployment emerging from the interaction between these effects.

The consensus among researchers is that around 50% of any increase in the tax wedge is passed on to employers in the medium term through increased wage demands, so that its growth during the 1980s would be expected to have substantial effects.⁵

Murphy (1987), in a paper for the Foundation for Fiscal Studies, concluded that a 1% increase in the tax wedge would reduce employment by between 0.2 and 0.25%. ; taking the NESO (1986, p.183) estimate that the wedge grew by 27.3% between 1980 and 1985, (of which 2.7 points were due to payroll tax increases, 14.7 to income taxes, and 9.9 to indirect taxes) we can therefore conclude that this could have been responsible, at most, for a 6.8% fall in employment in this period. His study relied on manufacturing data, however, and the actual fall in manufacturing employment in this period was 17%. The wedge in his analysis is therefore capable of explaining at most 30% of the actual fall in manufacturing employment in the period with which his analysis is concerned.

The study by Barry and Bradley (1991) looks not just at manufacturing but at the entire economy, and concludes that domestic policy in the 1979-1986 period, operating primarily through tax increases, accounted for 4.4 percentage points of the 10.2 percentage point increase in unemployment at this time.

b) Sectoral Structure, Structural Change and Unemployment

i) The Importance of Sectoral Structure

The analyses discussed so far have all been highly aggregative in the sense of treating the manufacturing sector as a homogenous entity. With the increased concentration on the supply side of the economy that we have seen over the course of the 1980s it has come to be recognised that this type of aggregative analysis masks some of the dramatic sectoral changes occurring in the makeup of Irish industrial employment, as Baker (1988) argued. Breaking the manufacturing sector into a "traditional" and a "modern" grouping reveals important differences in their experiences over recent decades. In particular, productivity growth was much more rapid in modern industry. Alongside starkly different rates of productivity growth, however, wage costs rose together in the two sectors.

Clearly, then, the undramatic competitiveness loss shown in the relative hourly earnings series would have a much greater impact on traditional manufacturing because productivity gains there are less able to finance wage increases; with traditional industry more labour-intensive to begin with, disequilibrating labour-cost movements would in any case exert a greater impact there.⁶

What this discussion would suggest is that fairly small movements in relative cost-competitiveness could have a substantial impact on employment in the traditional sector of manufacturing, with only perhaps a small effect on employment in the modern sector. This would go some way towards explaining why employment in the former sector has declined at an annual average rate of 4.2% in the period 1980-87, while growing at a rate of 2.9% in modern industry.⁷

While much of this modern industry is of overseas origin, it is important in discussing multinational investment to draw a distinction between UK and other overseas companies. The former are much closer to indigenous companies in terms of their characteristics, and as seen in Figure 7, the decline in overseas performance in the 1980s was overwhelmingly caused by the poor performance of UK companies. This category would appear to be in irrevocable decline, although the rate of decay may well be affected by cost competitiveness.

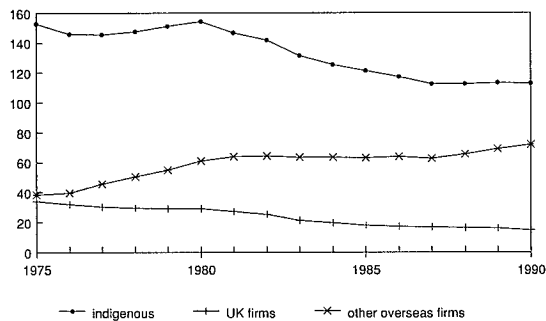
The other element required to understand overseas performance is an appreciation of the extent to which some of the processes governing the flow of multinational investment into the economy, and the consequent level of employment in that sector, are exogenous. The Survey of Current Business conducted by the US Department of Commerce reveals no clear relationship between movements in these variables and in Irish competitiveness.

5 See e.g. Hughes (1985), Murphy (1987) and the ESRI Macromodel.

6 This dualistic structure of Irish industry may make corporatism less appropriate a form of labour market organisation than in the more advanced small European economies.

7 Note that these statistics, from Baker (1988), p.42, are not based on the same categories as used in Figure 7.

Figure 7
Manufacturing Employment (ooo's)



Source: IDA

To see how employment in the "other overseas" category fell between 1981 and 1987 we need firstly to look at the level of multinational investment taking place, and then at its labour-intensity. For data reasons our focus must be on subsidiaries of US multinationals, which comprise the single most important group operating in the Irish economy:

Table 3: US Investment in Ireland

	A	B
1983	0.90	99.48
1984	1.21	109.51
1985	1.29	115.76
1986	1.23	145.43
1987	1.14	152.12
1988	1.19	189.92

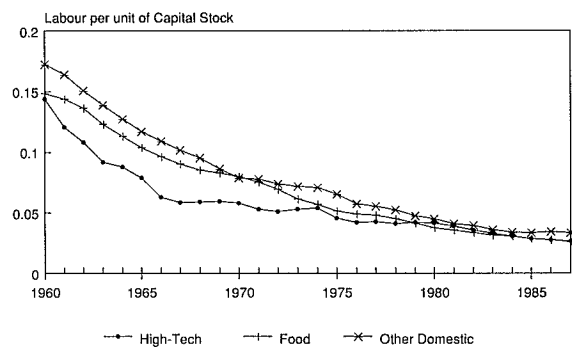
Note: Column A shows Ireland's % share of overseas investments (in manufacturing) by US multinationals; B shows Irish investments by US multinationals (in millions of 1980 Ir£).

The table shows that US multinational investment in the economy has been growing in real terms throughout the 1980's. Nevertheless, the IDA data shows a decline in employment in the "other overseas" category in the period up to 1987, which is presumably due then to the fact that production processes have been becoming more capital-intensive;⁸ (Figure 8 shows that this has in fact been the case for all industrial sectors.)

There is widespread agreement among researchers, though, that the capital-intensity of multinational production processes is largely determined by technological considerations rather than by domestic ("sink-country") factor-price ratios; see for example Lall (1978), and the very low gross factor-price elasticities reported by Bradley and FitzGerald (1990).⁹

The implication of this discussion, then, is that employment losses within the non-UK multinational sector have not been caused by changes in domestic factor costs. What this in turn suggests, however, is that since aggregate estimates of the elasticity of labour demand are averages across indigenous, UK and other

Figure 8
Labour/Capital Ratio in Industry



overseas industry, then the low elasticity posited here for the latter implies a correspondingly high elasticity for the others.

The fact that the aggregate-supply side of the economy has come to be recognised as the main domestic driving force behind long-term growth has led the ESRI research team of Bradley, FitzGerald and Kearney (1991) to disaggregate the manufacturing sector data into the two categories of traditional and high tech. This makes it possible to explore empirically the determinants of employment in the two sectors.

As we would expect from the general discussion above, they find the overall long-term elasticity of labour demand in the traditional sector to be substantially higher than in the high technology sector.¹⁰ The former has a value of unity compared to .6 for the latter.

Alongside this it must be remembered that the two sectors export into very different markets, so that the Central Bank's statistic on hourly earnings growth relative to that in our trading partners is insufficiently detailed, since it is primarily movements in Irish versus UK competitiveness that matter for the more vulnerable traditional sector.

An appreciation of the dollar alongside a fall in sterling, for example, could keep the real trade-weighted exchange rate constant but could nevertheless have serious consequences for Irish unemployment.

The studies discussed so far have paid little attention to exchange rates and the possible impact on unemployment of the 1979 change in Ireland's exchange rate regime. Leddin (1991) attempts to redress this balance, but the criticism of over-aggregation developed above applies here also. His argument is that the "hard currency regime" followed since EMS entry has led to an over-valuation of the trade-weighted exchange rate with consequent competitiveness loss and a deterioration in employment performance.

8 Note that the figures in the table above include reinvested earnings, which are unlikely to yield as much employment as greenfield investments because they tend to be used to change processes or to change capital equipment to allow a different range of products to be produced. Furthermore, since Ireland relies to such a large extent on US investment, it is worth noting that the US share in the total capital outflow of OECD countries in greenfield investments has declined substantially since the 1960s (Kenwood and Lougheed, 1983, p. 269).

9 These elasticities, of the order of -0.06, measure the response of industrial labour demand to real wage changes for a given level of output.

10 The high-technology sector consists of chemicals plus metals and engineering, and the traditional sector comprises the remainder, minus food processing.

From the point of view of this paper, trade-weighted exchange rates are a poor measure of competitiveness - as it impacts on employment, at least. What matters most in this regard is the competitiveness of traditional industry, and this should be measured relative to the UK. Leddin's own analysis shows that price competitiveness (adjusted for exchange rate changes) has not fluctuated much against the UK since 1979, which is perhaps not so surprising given the degree of integration of the two economies; what must be looked at therefore is relative cost competitiveness, for which real exchange rates calculated on the basis of consumer price indexes are inadequate.

An implication of all of this is that the Central Bank series should be augmented by one that shows Irish earnings relative to the UK in a common currency.

The overall conclusion of this section is that equilibrating changes in Irish cost competitiveness probably have little effect on non-UK multinational industry but can have quite substantial effects on traditional industry; there is however no published statistical series adequate to track these movements.

ii) Structural Change and Unemployment

The North/South divide would seem to have a role to play in the explanation of current British unemployment; are there such factors at work in Ireland? The issue here concerns the nature of, and the difficulty of adjusting to, sectoral or structural shocks (these difficulties being compounded by the unfavourable macroeconomic environment already discussed).

Lilien (1982) has shown that sector-specific shocks to the US economy have varied substantially in magnitude and frequency from one period to another, - being particularly high in the 1970's due to rapid technical change, the oil shocks, increasing competition from the NIC's, etc. - and that periods of greater dispersion in the rate of employment growth across sectors are associated with periods of high aggregate unemployment. (Lilien's argument that causation runs from the former to the latter through a slow rate of transfer from declining to expanding sectors has generated considerable controversy.)

The hypothesis draws attention to a possible relationship between structural change and long-lasting unemployment; this would be particularly so if hysteresis is important - i.e. if those who have been out of work for a long period of time no longer play any effective role in the labour market. Although difficult to encapsulate in a simple model, this way of thinking about the economy seems a potentially fruitful source of insights.

Why might the Irish economy have found structural adjustment in the 1970's and 80's more difficult to handle than did EC economies on average? An important reason is suggested in Paul Krugman's (1987) discussion of the likely effects of 1992:

"In its original formation, the Common Market was virtually tailor-made to foster intra-industry trade based on economies of scale rather than inter-industry specialization that might have posed large adjustment issues... The addition of Southern Europe to the scene, however, means that now trade within the EEC will involve partners with major differences in productivity, wages and resources... The point is that the trade expansion produced by EC enlargement is simply not likely to be as painless as the trade expansion produced by the formation of the Community and earlier enlargement. There will certainly be income distribution problems created by the changes, and also quite possibly some real costs in terms of unemployment."

Ireland, of course, was "the odd one out" in the previous enlargement, bearing a greater similarity to the peripheral countries which joined later, and so Krugman's warning would seem to apply retrospectively to us.

This is indeed corroborated by the research published in the NESc report (1989, esp. Chpt. 6) on Ireland in the European Community. The modern theory of international trade implies that the integration of fairly similar economies should lead not to massive relocation of whole industries (which would give rise to inter-industry trade) but to each country's industries specialising in a narrower range of products within each industry category (thereby engaging in intra-industry trade). The industrial restructuring required, and consequent adjustment difficulties, would be much greater in the former case.

McAleese's research (1979) reported a pronounced increase in the ratio of intra-industry to total trade (IIT) from 1964 to 1977 as Ireland integrated first with Britain and later with the EC economies, implying that the economy faced relatively minor adjustment problems.

The NESc report, however, finds that a substantial decline in IIT has occurred between 1977 and 1986 so that inter-industry adjustment has assumed much greater importance since that time. How can this be explained?

Inter-industry adjustment in the earlier period may have been held in check by the buoyant domestic demand which served to prop up traditional firms, if their base in the domestic market allowed them attain sufficient scale to develop into export markets; this would have delayed their ultimate annihilation wrought by import penetration alongside their inability to break into world markets to the extent necessary to ensure their survival.¹¹ The greater inter-industry adjustment in the later period may be due to the collapse of this sector alongside the growth of a new (multinational) sector in new branches of industry.

The issue is not simply one of sluggish employment adjustment within Ireland to structural change, however. Within a unified economic area jobs lost in one region (Ireland, Northern England) may be replaced by new job opportunities opening up elsewhere (Germany, Southern England), with unemployment stimulating migration as part of the equilibrating mechanism. (Thus

11 Krugman (1987b) presents a model in which temporary swings in macroeconomic policy can have permanent effects on the sectoral structure of production.

the NES (1989, p.168) report remarks, in discussing Ireland's integration into larger free trade areas, that "it would seem that in many industries even the larger Irish producers, instead of eliminating the tail of smaller higher cost local producers, were themselves a part of the tail of smaller producers in a British and Irish, or European Market".

Again these processes cannot be captured within highly aggregative macro models. We have already seen that dividing Irish manufacturing into traditional and modern sectors for the purpose of analysis quickly proves itself worthwhile.

Employment in traditional industry suffered only a small decline between 1966 (when free trade with the UK opened up) and 1980. In the 1980's demand contraction and a continuing profits squeeze have generated a decline of over 40,000 jobs in this sector.

At the same time, due primarily, it would seem, to changes in the capital intensity, availability, and sources of multinational investment, employment growth in the most modern sector of the economy - the non-UK overseas firms - has been considerably slower than during the 1970's.

Such structural changes would seem to have a large role to play in explaining movements in labour demand, and, a fortiori, in suggesting policy conclusions.

5 CONCLUDING COMMENTS

This paper has attempted to trace out and critically evaluate the shifting focus of economists' beliefs on the determinants of employment and unemployment. In the 1960s and 1970s the Keynesian view was widely held that domestic demand, and fiscal policy in particular, was a fundamental determinant of the employment level. Although many economists had already begun to question its validity for a small open economy, Keynesian fiscal policies were used by government from the mid-1970s to the early 1980s in an attempt to counter the impact of the generally depressed world economic environment.

By now the pendulum of belief has swung to the opposite end of the spectrum, and economists such as McAleese (1990), Giavazzi and Pagano (1990) and Newell and Symons (1990) are questioning whether fiscal policies have any such demand-side effects on employment at all.

The perspective that aggregate supply factors are of exclusive importance began to be developed in the 1970s, with a number of studies showing that inflation was largely externally determined. If domestic policies did not influence inflation, it was implied, this was because they did not tighten goods markets; therefore a fiscal expansion would simply affect the balance of payments and not employment. This is the "small open economy" view, and it implies that employment is completely determined by supply-side factors, particularly labour costs; domestic aggregate demand has no influence.

It has been argued here that that view is too extreme.¹² Drawing on the results of Walsh (1987) and Barry and Bradley (1991), based on different empirical methodologies, the paper shows that demand-side effects of fiscal policies on employment can be identified; the late 1970s fiscal expansion did stimulate the economy in the short run. The mechanism by which these effects are largely wiped out over time operates when the fiscal spending comes to be financed, as it must ultimately be, by tax increases. These of course raise production costs and wage demands.

The interaction between aggregate supply and demand is therefore more complex than that posited by the "small open economy" view. The policy error committed in the late 1970s was so severe because it involved the adoption of a pro-cyclical fiscal stance, meaning that the fiscal expansion was pursued when the world economy was already emerging from recession; the classic Keynesian prescription is for counter-cyclical policies, so that deficit spending used to moderate the impact of recession can be financed by the revenue buoyancy that occurs during the expansionary phase of the business cycle. The earlier expansion, with its implications for the debt/GNP ratio, forced the adoption of another pro-cyclical (but this time contractionary) stance when the next world recession struck; this plunged the economy into a far more severe recession than would otherwise have occurred.

To defend the importance of the demand-side is not to downplay the paramount significance of aggregate supply. More and more research has been devoted to this area in the last decade, since it has come to be recognised as the engine-room of the economy, and the importance of the sectoral structure of production for employment has begun to be explored. The supply-side crowding out effects that occurred through the tax wedge had quantitatively very different effects on different sectors. For traditional industry, which comprises much of both indigenous and UK industry in Ireland, cost competitiveness appears to be of major significance, while for non-UK overseas firms, labour-cost competitiveness appears to be much less important, probably being dominated by factors such as the low rate of corporation tax and economies of agglomeration. The long-term trends in the relative sizes of these sectors will affect the strength of these crowding out effects in the future; the fact that employment was heavily concentrated in traditional industry when the tax wedge expanded rapidly in the early to mid-1980s magnified its negative effects.

The increasing focus on the supply side also drew our attention in this paper towards some structural factors which have until now been rarely discussed. One major topic in particular has been identified as requiring further research; that is the extent to which the economy's adjustment to the progressive liberalisation of trade alongside the large fluctuations in domestic demand has entailed substantial inter-industry adjustment, in contrast to the less difficult intra-industry restructuring experienced by the core EC economies whose factor endowments (in the sense of capital-labour ratios) are closer to the EC average.¹³

¹² Barry (1987) discusses how the SOE view of inflation can be consistent with demand-effects on employment.

¹³ On the relationship between factor endowments and intra-industry trade, see e.g. Helpman and Krugman (1985).

This issue has not been treated at all in the econometric research on Irish unemployment. An analysis along the lines of Lilien (1982) should be possible, and could represent a significant contribution to our understanding of this major national problem.

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