
The Association between Economic Growth and Employment Growth in Ireland

NATIONAL ECONOMIC AND SOCIAL COUNCIL

Constitution and Terms of Reference

1. The main tasks of the National Economic and Social Council shall be to provide a forum for discussion of the principles relating to the efficient development of the national economy and the achievement of social justice, and to advise the Government through the Taoiseach, on their application. The Council shall have regard, inter alia, to:
 - (i) the realisation of the highest possible levels of employment at adequate reward.
 - (ii) the attainment of the highest sustainable rate of economic growth.
 - (iii) the fair and equitable distribution of the income and wealth of the nation.
 - (iv) reasonable price stability and long-term equilibrium in the balance of payments.
 - (v) the balanced development of all regions in the country, and
 - (vi) the social implications of economic growth, including the need to protect the environment.
2. The Council may consider such matters either on its own initiative or at the request of the Government.
3. Members of the Government will meet regularly with NESC on their initiative or on the initiative of NESC to discuss any matters arising from the terms of reference and in particular to discuss specific economic and social policy measures and plans and to explore together proposals and actions to improve economic and social conditions. Any reports which the Council may produce shall be submitted to the Government, and shall be laid before each House of the Oireachtas and published.
4. The membership of the Council shall comprise a Chairman appointed by the Government in consultation with the interests represented on the Council, and
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 - Five persons nominated by the Confederation of Irish Industry, the Federation of Irish Employers and the Construction Industry Federation;
 - Five persons nominated by the Irish Congress of Trade Unions;
 - Nine other persons nominated by the Government, including one from the National Youth Council, the Secretary of the Department of Finance, the Secretary of the Department of Industry and Commerce, and the Secretary of the Department of Labour.Any other Government Department shall have the right of audience at Council meetings if warranted by the Council's agenda, subject to the right of the Chairman to regulate the numbers attending.
5. The term of office of members shall be for five years. Casual vacancies shall be filled by the Government or by the nominating body as appropriate. Members filling casual vacancies may hold office until the expiry of the other members' current term of office.
6. The numbers, remuneration and conditions of service of staff are subject to the approval of the Taoiseach.
7. The Council shall regulate its own procedure.

NATIONAL ECONOMIC AND SOCIAL COUNCIL

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	Page
SUMMARY.....	3
1. INTRODUCTION.....	9
2. COMPARATIVE REVIEW OF OUTPUT AND EMPLOYMENT PERFORMANCE 1960-1990.....	12
2.1 Long-run Performance;.....	12
2.2 The Impact of Falling Agricultural Employment;.....	16
2.3 Variations Within Sub-Periods.....	20
3. THE IMPACT OF MANUFACTURING INDUSTRIES.....	31
3.1 Relationships Between Output Growth and Employment Growth in OECD Manufacturing Industry: The Record Since 1970;.....	31
3.2 The Causes of Rapid Productivity Growth in Irish Manufacturing Industry;.....	35
3.3 The Indirect Effects of Manufacturing Growth on Services Employment;.....	60
4. THE PERFORMANCE OF THE SERVICES SECTOR.....	64
4.1 Share of Services in Total Output and Employment;.....	64
4.2 Employment Performance in the Services Sector;.....	67
4.3 Productivity Trends;.....	74
4.4 Productivity Changes within the Market Services Sector in Ireland; ..	79
4.5 Concluding Comments.....	82

THE RECORD OF GROWTH AND EMPLOYMENT.....	84
5.1 US and European Models of Employment Growth;.....	84
5.2 Recent Changes in the Employment-Intensity of European Growth....	89
6. CHARACTERISTICS OF RECENT IRISH GROWTH.....	96
7. AREAS FOR FURTHER EXAMINATION.....	103

APPENDICES

APPENDIX 1

Average Annual Growth Rates of Manufacturing Output, Employment and Productivity, OECD Countries: 1970-1989 (Figure 1), 1970-1979 (Figure 2) and 1979-1989 (Figure 3).

APPENDIX 2

Sectoral Trends in Output, Employment and Productivity; Manufacturing Industries; Ireland, 1973-1990.

APPENDIX 3

Decomposition of Employment Growth in Manufacturing Industry identifying changes due to gross output expansion and changes due to labour productivity growth.

APPENDIX 4

Services Sector: Definitions and Data used.

APPENDIX 5

Decomposition of the increase in the Wage Bill in terms of (i) increasing employment and (ii) increasing real average compensation per employee.

The Association between Economic Growth and Employment Growth in Ireland

The Council and Secretariat of NESC acknowledge the assistance of officials of the Central Statistics Office and the Department of Finance who provided the essential data for this report. Responsibility for interpretation rests with the Secretariat.

PURPOSE OF THIS REPORT

While employment in Ireland grew at the same rate as in the EC as a whole during the late 1980s, the *sustained* rate of employment growth in Ireland has never been sufficient to cater for the potential increase in the labour force at prevailing wage rates. The result has been prolonged episodes of large-scale emigration and/or high unemployment. Over the period 1960-1990, total employment in Ireland grew by just 8% from 1.04 million to 1.13 million. During the same three decades, employment in the EC rose by 13%, while employment in the wider OECD group of developed economies grew by a much stronger 39%.

The massive decline in agricultural employment over the past three decades has played a significant role in slowing the rate of growth of total employment in Ireland. While a similar phenomenon was evident elsewhere, its impact was considerably more pronounced in Ireland than in other, more developed economies because of the relatively large share of the workforce employed in agriculture. Ireland's long-run record with respect to the growth of *non-agricultural* employment is thus considerably better than its record of *total* employment growth: Between 1960 and 1990, non-agricultural employment in Ireland grew by an average of 1.3% per annum. This was well above the average rate of non-agricultural employment growth in the EC (0.9% p.a), although it remained below the high levels of non-agricultural employment growth achieved in the OECD generally (1.6% p.a).

This document represents the first step in a two-stage investigation of the links between economic growth and employment growth. The purpose of this first stage is to describe the historical association between the growth of output and employment in Ireland and in other Western economies over the past thirty years; to highlight how this relationship has varied over time, both within countries and between different countries; and to show how differences in the structure and composition of growth have contributed to the development patterns observed. In subsequent work by the Council, it is proposed to build-on and develop some of the issues raised by this initial report. The focus then will be *on interpreting* and *explaining* the different development patterns described herein, and identifying the *policy options* open to Ireland in seeking to secure an improved employment outcome in the future.

THE LONG-RUN RECORD OF OUTPUT AND EMPLOYMENT GROWTH

The growth of employment is determined by the rate of economic growth, the sectoral composition of growth and the techniques by which output is produced. This document uses comparative data on the growth of output and employment in a range of western economies over the period 1960 to 1990 to consider how the historical association between output growth and employment growth has varied over time, both within Ireland and between Ireland and other countries. It shows that, over the past thirty years, Ireland's long-run rate of economic growth (3.2% per annum) has been slightly below both the EC (3.4% p.a.) and OECD (3.6% p.a.) averages. Ireland's rate of employment growth (0.3% p.a.) has been in line with that of other late-developing European countries (e.g. Spain and Greece) while being slightly below the average rate of employment growth for the EC as a whole (0.4% p.a.). By European standards, therefore, Ireland's overall employment performance is slightly below average. However, the real divergence in employment performance occurs not within the EC (where average long-run rates of employment growth lie within a very narrow band), but *between EC and non-EC countries*. The average annual rate of employment growth in the OECD over the period 1960-1990 was 1.1% p.a., which is more than three-and-a-half times the EC average. Given that the OECD average itself incorporates the (low) results for EC countries, the gap between EC and non-EC countries must be even wider. Thus, countries such as the US (1.9% p.a.), Canada (2.4% p.a.) and Australia (2.2% p.a.) each display long-run rates of employment growth well in excess of the OECD average.

The most striking feature of these global figures is the dramatic difference between the average employment-intensity of growth in EC and non-EC economies: in the EC, every 1% increase in GDP during 1960-1990 was associated with a rise in employment of just 0.12%; in non-EC economies such as the US, Canada and Australia, the equivalent employment rise was between 0.56% and 0.59%. Ireland, in common with other late-developing European economies, lies at the *lower* end of the European spectrum with regard to employment intensity. This suggests that, for the EC generally and for Ireland in particular, the poor employment performance of the past thirty years relative to non-EC countries owes more to the substantial differences in the average employment-intensity of growth between the two zones than to the (relatively small) differences in the long-run rate of economic growth.

The fact that the four late-developing economies examined (Spain, Greece, Portugal and Turkey) each achieved average rates of economic growth of at least 4.6% per annum over the thirty-year period reviewed warns against any complacency regarding the adequacy of Ireland's long-run growth rate.

These countries were among the fastest-growing economies in the OECD and their output growth was considerably in excess of Ireland's long-run trend of 3.2% p.a. Viewed from the perspective of a late-developing, peripheral economy, Ireland's record of output growth appears somewhat less satisfactory than the global figures might suggest, and has undoubtedly contributed to our relatively poor employment performance. Despite this, it remains the case that the gap between Ireland and the high employment-growth countries *primarily* reflects differences in the employment-intensity of growth, with differences in output growth rates playing a relatively minor, contributory role.

VARIATIONS BETWEEN SUB-PERIODS

The long-run profile covers a thirty-year period which has seen dramatic structural changes and considerable variations in both output and employment performance within different sub-periods. These changes have been associated with significant changes in the nature and composition of economic growth and, hence, with the amount of employment growth associated with any given rate of output growth. The relationship between output growth and employment growth is not, therefore, a stable one but has varied considerably over time, both in Ireland and in other countries.

During the 1960s and 1970s, the *long-run decline in agricultural employment* played an important part in reducing the aggregate employment intensity of growth in Ireland relative to that of other countries. The relatively large size of Ireland's agricultural sector meant that reductions in agricultural employment had a disproportionate impact on Ireland's overall output/employment relationship. In effect, Ireland was obliged to achieve above-average employment returns from growth in its non-agricultural sectors in order to compensate for the impact of falling agricultural employment.

By the 1980s, agriculture's influence on aggregate employment intensity in Ireland had declined (although it remained more important than in other countries) and the role of *manufacturing industry* in determining output/employment relationships in the economy had become more critical. During the 1980s, the proportion of growth coming from the relatively low labour-intensity manufacturing sector was significantly higher in Ireland than in other countries. In addition, the rate of productivity growth within Irish manufacturing in the 1980s was substantially above that of any other OECD country. Both of these factors served to reduce the employment impact of Irish economic growth relative to other countries in the 1980s.

...factor serving to reduce the relative employment-intensity of growth in Ireland in the 1980s was the slowdown and subsequent contraction of Ireland's non-market services sector. The swings in Irish *fiscal policy* in the 1970s and 1980s had the effect of exaggerating the extent of the decline in the labour intensity of output in Ireland between these two periods: the expansion of public sector employment in the latter half of the 1970s, and the unsustainable fiscal policy-induced expansion in labour-intensive sectors such as the construction industry and market services, increased the employment intensity of growth at that time. It had its counterpart, however, in a fall in employment intensity in the 1980s, as public sector employment was cut back and unavoidable fiscal correction prompted reductions in private sector output and employment.

In Europe during the latter half of the 1980s, several countries experienced a rise in employment-intensity, which helped to push average employment-intensity in the EC up towards OECD levels. Two factors contributing towards the rise in employment-intensity in these countries were the rise in the share of (labour intensive) services as a proportion of total output growth, and a slowdown in the rate of productivity growth within the services sector. In Ireland, the contraction in non-market services during 1985-90, partly resulting from fiscal policies, militated against both of these tendencies: firstly, the share of services in Irish economic growth during the late 1980s was held back, not alone by the very rapid growth of manufacturing industry, but also by the contraction of output growth in the non-market services sector. The contribution of non-market services to output growth in Ireland fell from a substantial positive (of 17.2%) in 1970-79 to a small *negative* (of 2.4%) in 1986-90. This significant turnaround in non-market services accentuated the already unusual composition of Irish economic growth in these years. Secondly, the reduction in non-market services employment in Ireland after 1985 exerted upward pressure on productivity growth rates within the Irish service sector as a whole. The effect of this was to offset partially the impact of falling productivity growth in the *market* services sector, thus contributing towards a *smaller* reduction in service productivity growth rates in Ireland than in most other European countries. The net effect was that Ireland failed to share in the increase in employment intensity which occurred in Europe in the late 1980s. This was a departure from the long-run trend which has seen Ireland follow closely the general European norm.

THE RECENT IRISH GROWTH PATTERN

The principal characteristics which distinguish recent Irish economic growth from that of other western economies are (i) the very high proportion of growth accounted for by the manufacturing sector, (ii) the exceptionally rapid rates of productivity growth recorded in that sector, and (iii) the unusually severe contraction in the non-market services sector in Ireland during the second half of the 1980s. The first two of these characteristics are significantly overstated due to the effects of transfer pricing. Adjusting the data to control for these effects shows, however, that the substantive conclusions arrived at are exaggerated, but not invalidated, by this phenomenon. In particular, it is clear that, even without transfer pricing, the rate of growth of Irish manufacturing output and productivity remains high relative to other countries, and the share of manufacturing industry in overall output growth continues to exceed that of most other western economies. These features have undoubtedly served to reduce the employment impact of Irish growth relative to that obtaining elsewhere.

Trends in output, employment and productivity growth are not determined independently, but are critically related to each other. Thus, for example, the rapid growth of manufacturing output in Ireland during the 1980s was not simply *accompanied* by substantial rises in labour productivity, but was itself made possible by the large-scale changes in the structure of manufacturing output which *caused* much of that productivity rise. Falls in labour intensity can therefore have a dual effect: they reduce the employment effect of a given output growth rate, while at the same time tending to increase the actual rate of output growth. The net effect on employment is dependent on the relative size of these two effects. If the decline in labour intensity is associated with a rise in *total* factor productivity in the economy, thus pointing to an improvement in the overall efficiency of production and a rise in the country's international competitiveness, the positive effects on output growth may be quite large. If, however, falls in labour intensity are caused primarily by the substitution of capital for labour, then the net effect on total factor productivity may be small and the stimulus to output growth relatively insignificant. **Clearly, understanding the reasons for changes in a country's employment intensity is critical, if the implications for future employment growth are to be properly assessed.**

The fact that the employment intensity of Irish economic growth in recent years has been lower than in other countries does not imply that the actual rate of employment growth must also be lower. In fact, in the late 1980s, Ireland's employment growth rate was the same as that of the EC as a whole, despite a significantly lower employment-intensity of growth. This is because the rate of output growth in Ireland during these years was also higher than average. The choice, therefore, need not necessarily be between

a "low productivity growth/high employment growth" economy on the one hand, and a "high productivity growth/low employment growth" economy on the other. High productivity growth rates in Ireland have been accompanied by significant convergence of income per worker with the EC average. A similar degree of convergence between income levels per head has not occurred, because the proportion of the population in employment in Ireland has been declining and dependency ratios have been rising. The question of which development pattern is appropriate and feasible for Ireland is a crucial one, which will be returned to in the second phase of this project.

POLICY IMPLICATIONS

Fears that Ireland has entered a period of "jobless growth" are not borne out by this analysis. It is clear, however, that the *extent* to which economic growth impacts on employment growth is determined as much by the structure and composition of growth, as by the absolute rate of growth. It is also clear that recent trends in the structure and composition of Irish growth have tended to *reduce* the employment intensity of Irish growth relative to other countries. Efforts to improve the employment performance of the Irish economy must recognise this fact, while at the same time appreciating the interaction between these three elements and understanding that different priorities may be appropriate in different areas of the economy. In some sectors, where output growth rates are already very high, the priority must be to maximise the employment effects of that growth (eg. by increasing the indirect employment effects of growth in overseas owned, high-tech industry). In others, where the primary explanation for poor employment performance lies in the inadequacy of output growth rates (eg. traditional Irish-owned industry), the urgency must be to improve output growth. In many instances, this may require a fall in employment intensity in order to bring Irish productivity levels into line with that of other more developed economies.

The study confirms the importance of securing high rates of economic growth but it highlights the fact that the structure and composition of growth are crucial determinants of employment performance. While output growth may not be a *sufficient* condition for securing employment growth, without it increases in employment can only be achieved by reducing the average income levels of those at work. Given the high rates of productivity growth which have applied in Ireland and given the continuation of present trends, significant employment growth will require the sustained achievement of historically very high rates of output growth. The Council has already identified the principal features of a macro-economic strategy to maximise output growth. In the second phase of this project the Council will examine the options for structural policy to increase the employment effects of growth.

1. INTRODUCTION

The expansion of employment is a central concern of the Council. In 1990 the Council, in *Strategy for the Nineties*, considered that the projected expansion of employment in the years ahead was "entirely unacceptable" having regard to the projected implications for unemployment and emigration. Since then, a substantial deterioration in the external economic environment facing Ireland has meant that employment growth has ceased, traditional emigration outlets have been closed off and unemployment has risen to reach record highs.

If the rate of employment growth is to be increased, then there are in principle two broad ways of achieving this¹:

- (i) the rate of output growth can be increased;
- (ii) the employment intensity of a given level of output growth can be increased.

The pursuit of both of these approaches was the rationale for the overall strategy for the nineties advocated by the Council. This advocated:

- (i) a consistent economic strategy for budgetary, monetary and exchange rate policy to secure continued economic stability;
- (ii) a consensus on income developments, giving priority to increasing employment over growing living standards;
- (iii) a radical policy programme to improve internal efficiency, enhance international competitiveness and overcome barriers to long-run development.

Recently, there has been public comment on an apparent contrast between the impressive growth of the Irish economy in recent years and the deepening of the crisis of unemployment. The Council's previous analysis² of the Irish labour market has demonstrated that increases in the level of employment in

1 In practice, these two approaches are unlikely to be so starkly defined. Changes in the rate of economic growth may *necessitate* changes in the employment-intensity of growth. Similarly, a change in the employment-intensity of growth may itself contribute towards a change (either positive or negative) in the rate of economic growth. The interdependence between the rate of economic growth in Ireland and the *employment-intensity* of that growth is clear from some of the sectoral analysis later in this report (see, for example, Section 3).

2 Such as Report No. 86, *The Nature and Functioning of Labour Markets*.

Ireland do not feed through into commensurate reductions in the level of *unemployment*. This is because an increased demand for labour is likely to induce an increase in labour *supply* through: (a) an increase in the labour force participation rate of those previously outside the labour force, especially married women; (b) a reduced level of net emigration; and (c) an increase in the rate of decline of the agricultural labour force. The degree to which labour supply responds to changes in the demand for labour is significantly higher in Ireland than in other countries, and makes the task of reducing unemployment particularly difficult. It means that a substantial element of any increase in employment growth will be met by increases in the size of the available workforce, rather than by a fall in unemployment.

Given the elasticity of Ireland's labour supply, it is not surprising that even very credible levels of economic growth would not automatically result in comparable reductions in the level of unemployment.³ However, it would be a matter of great concern if significant rates of economic growth were not to have a positive effect on the *demand* for labour. It is the alleged lack of congruence between measured levels of *economic growth* and the recorded level of *employment* which is at the heart of recent expressions of concern.

In order to present the data on output and employment trends, and to see how they have moved together over time, it is necessary to find some way of *combining* the two series. If our objective was to seek to *explain* differences in employment performance across countries, then a detailed specification of the assumed relationship between output growth and employment growth would be required. Such a specification would need to be firmly grounded in economic theory and, ideally, capable of empirical testing. Our objectives at this initial stage of the study are more modest, however, and seek only to *describe*, in a systematic and easily-understood way, the historical pattern of output and employment growth. For this reason, we have chosen to use two very simple methods of combining the output and employment statistics⁴. The first measure adopted is the *employment intensity of growth*. This is defined as the ratio of employment growth to output growth (employment growth/output growth). It describes the amount of employment change

3 The relationship between economic growth and the rate of unemployment is known as *Okun's law*. Leddin and Walsh (1992) demonstrates that this relationship is weaker in Ireland than the US. The US evidence suggests that the rate of unemployment will increase unless the rate of growth of GNP is above 3%, and that every additional 1% of GNP growth (above the 3%) lowers the unemployment rate by 0.5 percentage points. In Ireland GNP has to grow by at least 3.8% in order to avert an increase in unemployment, and each additional 1% of GNP growth reduces the unemployment rate by only 0.4 percentage points.

4 Similar methods of presentation have been employed by, for example, Walsh (1992) and Adams et al (1986)

which has, on average, been associated with every one per cent change in output. The second measure which we use is the change in the *labour intensity of production*. The labour intensity of production is defined as the number of units of labour (employed) per unit of GNP. It is the inverse of the average product of labour. A low rate of decline in the labour intensity of production is equivalent to low productivity growth.

The Report is organised as follows: *Section 2* provides an overview of Ireland's growth and employment performance over the past 30 years, highlighting how Ireland has fared relative to other countries and focusing on differences in performance at various times over that period.

Sections 3 and 4 look in detail at the performance of the manufacturing and services sectors, to highlight how developments in these sectors have influenced the employment-intensity of Irish economic growth relative to that of other countries.

Section 5 considers some of the factors which are associated with variations in the employment experiences of different countries, with particular reference to long-run differentials in employment growth between Europe and the USA and recent changes in the employment-intensity of growth within the EC.

In *Section 6*, the characteristics of Irish economic growth during the recovery period of the late 1980s are discussed, with a view to showing how the sectoral developments and international trends outlined in earlier parts of the Report combined to produce a relatively *low* employment-intensity of growth in Ireland during this period.

Finally, *Section 7* outlines a number of areas which require further examination, with a view to (a) determining their effects on the employment impact of economic growth in Ireland, and (b) identifying the extent to which, and manner in which, these effects are subject to domestic policy influence. These issues will be considered by the Council in the second phase of the project whose parameters are set by this report.

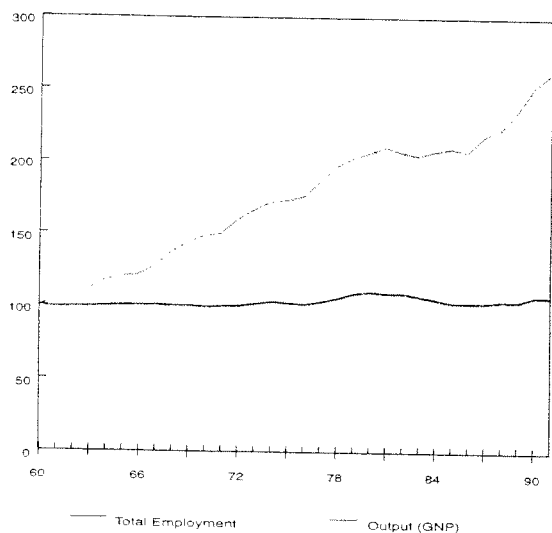
2. COMPARATIVE REVIEW OF OUTPUT AND EMPLOYMENT PERFORMANCE 1960-1990

2.1. Long-run Performance

It is now over three decades since economic growth was adopted as a primary objective by Irish policy makers. Following the publication of *Economic Development* (1958), a set of policies was put in place to foster growth through free trade and the promotion of inward investment. There is a perception that the Irish economy has a reasonably strong record of growth, but that this growth has not produced jobs. Certainly, at an aggregate level, there is some basis for this view. This is apparent from Figure 1 below, which charts trends in the level of Irish output and employment from 1960-1991. It is clear from the graph that the past thirty years have seen little net growth in total employment, despite a substantial rise in national output.

FIGURE 1

Total Employment and Output Ireland, 1960-1991 (Index: 1960=100)



Source: Output: CSO, *National Income and Expenditure*; Employment: Department of Finance Databank.

5 The two principal measures of output are Gross Domestic Product (GDP) and Gross National Product (GNP). Gross Domestic Product (GDP) is a measure of all output produced within the economy and, other things being equal, would be the appropriate measure for our present purpose. However, for reasons outlined in Section 4 of this report, the use of GDP would result in an overstatement of Ireland's economic growth rate. Therefore, for the purposes of this study, GNP (which is defined as GDP minus net factor income from abroad) is deemed to be a more appropriate measure of output growth for Ireland.

TABLE 1
Average Annual Growth Rates of Employment and Output,
OECD Countries, 1960-1990 % Per Annum

	Employment	Output	Employment Intensity ¹
United States	1.9	3.2	0.59
Canada	2.4	4.2	0.57
Australia	2.2	3.9	0.56
New Zealand	N.A.	2.4	N.A.
Japan	1.1	6.3	0.17
Germany	0.3	3.1	0.09
United Kingdom	0.4	2.4	0.17
France	0.4	3.7	0.10
Italy	0.1	3.9	0.03
Austria	N.A.	3.5	N.A.
Belgium	0.3	3.4	0.09
Denmark	N.A.	2.9	N.A.
Finland	0.5	3.8	0.13
Iceland	2.1	4.5	0.47
Luxembourg	N.A.	3.2	N.A.
Netherlands	N.A.	3.3	N.A.
Norway	N.A.	3.8	N.A.
Sweden	0.8	2.8	0.29
Switzerland	N.A.	2.7	N.A.
Ireland	0.26	3.2	0.08
Peripheral European:			
Greece	0.3	4.6	0.07
Portugal	N.A.	4.6	N.A.
Spain	0.3	4.6	0.07
Turkey	N.A.	5.4	N.A.
EC	0.4	3.4	0.12
OECD	1.1	3.6	0.31

¹ Employment-intensity of growth equals average annual rate of employment growth, divided by average annual rate of output growth (Column (i) (ii)). It shows the average percentage increase in employment associated with each one per cent rise in output.

N.A.: Not Available

Source: OECD (1992), *Historical Statistics, 1960-1990*. Irish data as for Figure 1.

In this section, we will review Ireland's long-run record with respect to output and employment growth, relative to that of other Western economies. How does Ireland's employment performance compare with other countries? How does its output performance compare? Is the gap between output growth and employment growth which was seen in Figure 1 unique to Ireland, or have other countries experienced a similar phenomenon?

Table 1 provides a useful starting point for a discussion of these and similar questions. It presents the average annual growth rates of output and employment in 24 OECD countries (including Ireland) during the period 1960-1990, together with a measure of the average employment-intensity of growth in each country. The latter, which is given in the final column of Table 1, shows the average percentage increase in employment which was associated with each one per cent rise in national output in each of the countries shown during the thirty-year period under review.

Employment Performance

Looking first at employment growth, Table 1 shows that from 1960 to 1990, employment in Ireland grew by only 0.3% per annum. This is among the lowest rates of employment growth in the OECD. It is, however, in line with the average long-run rate of employment growth achieved in the two late-developing peripheral European countries for which we have data (Spain and Greece), and is only slightly below the average employment growth rate recorded for the EC as a whole (0.4% p.a.).

The real divergence in employment performance evident in Table 1 occurs not *within* the EC (where average long-run rates of employment growth lie within a very narrow band), but *between EC and non-EC countries*. The average annual rate of employment growth in the OECD over the period 1960-1990 was 1.1% p.a., which is more than three-and-a-half times the EC average. Given that the OECD average itself incorporates the (low) results for EC countries, the gap between EC and non-EC countries must be even wider. Thus, countries such as the US (1.9% p.a.), Canada (2.4% p.a.) and Australia (2.2% p.a.) each display long-run rates of employment growth well in excess of the OECD average.

The sustained divergence in employment performance between EC and non-EC countries over such an extended period has had profound implications for the actual numbers employed in these economies at the end of the period. This is clear when we consider that, if Ireland had achieved employment growth in line with the OECD average (1.1% p.a.) over the past

thirty years, total employment in Ireland would have stood at 1.45 million in 1990. The actual employment level in 1990 was 1.13 million, a difference of 320,00 jobs.

Output Performance

Turning now to output growth, Table 1 shows that, over the thirty years from 1960 to 1990, Ireland's long-run growth rate averaged 3.2% per annum. Ireland ranked twelfth in terms of growth rates among the twenty-three countries considered. Its growth rate was marginally below the EC average (3.4% p.a.) and was also lower than the OECD average (3.6% p.a.). Given the relatively underdeveloped nature of the Irish economy at the start of this period, faster growth might have been expected. It is notable in this regard that all four of the peripheral European economies examined in Table 1 (Spain, Greece, Portugal and Turkey), experienced significantly faster trend growth rates than Ireland during this thirty-year period.

Employment Intensity

Looking finally at the growth of employment *relative* to output growth in each country, we can see from the final column of Table 1 that the average employment intensity of growth in Ireland over the period 1960-1990 was 0.08. This means that every 1 per cent of GNP growth in Ireland during these years was associated with an average of 0.08 per cent growth in employment. This ratio was among the lowest of the countries examined, although the two peripheral EC countries for which we have data (Spain and Greece) recorded marginally *lower* average employment intensities, at 0.07 each. The average increase in employment associated with every 1 per cent growth in output was 0.12 for the EC as a whole, while in the OECD the average employment-intensity of growth was considerably higher, at 0.31.

Review of the Long-Run Record

The evidence to date may be summarised as follows: taking the period 1960-1990 as a whole, Ireland's rate of economic growth has been slightly below-average, while its rate of employment growth has also been below both the EC and, more dramatically, the OECD averages. The most striking feature of Table 1 is the significant gap between the average labour intensity of growth in the EC (0.12) and in non-EC OECD countries, such as the US, Canada and Australia, where the ratios all exceeded 0.56. Ireland, in common with other late-developing European economies, lies at the *lower* end of the

European spectrum with regard to employment intensity. This suggests that, for the EC generally and for Ireland in particular, the poor employment performance of the past thirty years relative to non-EC countries owes more to the substantial differences in the average employment-intensity of growth between the two zones than to the (relatively small) differences in the long-run rate of economic growth.

The fact that the four late-developing economies examined (Spain, Greece, Portugal and Turkey) each achieved average rates of economic growth of at least 4.6% per annum over the thirty-year period reviewed warns against any complacency regarding the adequacy of Ireland's long-run growth rate. These countries were among the fastest-growing economies in the OECD and their output growth was considerably in excess of Ireland's long-run trend of 3.2% p.a. Viewed from the perspective of a late-developing, peripheral economy, Ireland's record of output growth appears somewhat less satisfactory than the global figures might suggest, and has undoubtedly contributed to our relatively poor employment performance. Despite this, it remains the case that the gap between Ireland and the high employment-growth countries reflects *primarily* differences in the employment-intensity of growth, with differences in output growth rates playing a relatively minor, contributory role.⁶

3.2 The Impact of Falling Agricultural Employment

The long-run data presented in Table 1 cover a period which has seen a dramatic fall in the numbers employed in the agricultural sector. This decline has occurred throughout the OECD, but its impact on total employment has been most pronounced in countries such as Ireland which had a relatively large share of their workforce employed in agriculture at the start of the period.

6 A crude indication of the relative significance of these two effects is given by the fact that, if Ireland had emulated the long-run growth record of other late-developing economies (4.6% p.a.) over the period 1960-1990, while maintaining the same average labour-intensity of growth (0.08), its average rate of employment growth would have risen from 0.3% p.a. to 0.4% p.a. If, on the other hand, Ireland had maintained its existing rate of output growth (3.2% p.a.) but had been able to combine this with the average OECD level of employment-intensity (0.31), then employment growth would have been raised to an average of 1.0% p.a. These calculations are clearly simplistic in that they ignore the important interdependence between rates of output growth and changes in employment intensity. Nor do they provide any information on whether, and how, output growth or employment intensity could have been altered in Ireland to produce the results suggested. They do, however, serve to illustrate the relatively large impact which variations in employment intensity can have on the actual rate of employment growth achieved.

Agricultural Employment as a Proportion of Total Employment OECD Countries, 1960 and 1990

	Agriculture as % of Total Employment		Change in Share 1960-1990 (% points)
	1960	1990	
United States	8.5	2.8	- 5.7
Japan	30.2	7.2	-23.0
Canada	13.2	4.2	- 9.0
Australia	11.0	5.6	- 5.4
New Zealand	14.6	10.6	- 4.0
Germany	14.0	3.4	-10.6
France	22.5	6.1	-16.4
United Kingdom	4.7	2.1	- 2.6
Italy	32.6	9.0	-23.6
Austria	22.6	7.9	-14.7
Belgium	8.7	2.7	- 6.0
Denmark	18.2	5.6	-12.6
Finland	35.2	8.4	-26.8
Iceland	22.9	10.3	-12.6
Luxembourg	16.6	3.3	-13.3
Netherlands	9.8	6.5	- 3.3
Norway	21.6	6.5	-15.1
Sweden	15.7	3.3	-12.4
Switzerland	14.5	5.6	- 8.9
Ireland	37.3	15.0	-22.3
Peripheral European:			
Greece	57.1	24.5	-32.6
Portugal	43.9	17.8	-26.1
Spain	38.7	11.8	-26.9
Turkey	75.9	47.8	-28.1
EC	21.1	6.5	-14.6
OECD	21.6	7.5	-14.1

Source: OECD (1992), Historical Statistics, 1960-1990.

Table 2 presents agricultural employment as a proportion of total employment in OECD countries, in 1960 and again in 1990. It shows that the decline in the share of agricultural employment has been significantly stronger in Ireland and in other late-developing economies, than in the more developed economies such as the US, Canada, Australia or the UK. Agriculture's share of total employment in Ireland fell from 37.3% in 1960 to 15.0% in 1990, a drop of 22.3 percentage points. In the US, over the same period, the drop in agriculture's share amounted to just 5.7 percentage points.

The relatively large size of Ireland's agricultural sector, and the resultant scale of outflows from that sector, have made the task of securing net increases in employment significantly more difficult for Ireland than for other more developed economies. In essence, substantial falls in agricultural employment have had to be offset by an equivalent rise in non-agricultural employment, before any increase in net employment could be recorded. While similar processes were at work in all countries, their effect was more pronounced in Ireland and other late-developing countries than in the more developed economies.

An implication of the above is that the growth in Ireland's non-agricultural employment over the past 30 years has been significantly faster than that of total employment. This gap between the growth in total employment and the growth in non-agricultural employment is not present to the same extent in developed economies, such as the US. Ireland's *relative* performance with respect to employment growth is thus considerably better when judged in terms of non-agricultural employment, than in terms of total employment. This is shown in Table 3 below.

Table 3 shows the annual average growth in non-agricultural employment in a number of OECD countries for the period 1960-1990. Details of the growth in total employment are also recalled (from Table 1) for purposes of comparison. The table shows that non-agricultural employment in Ireland grew by an average of 1.3% per annum during 1960-1990. This is significantly better than the average EC performance (0.9% p.a.). It is below the OECD average of 1.6% per annum, but the shortfall in employment performance is considerably less than was the case with respect to total employment growth (0.3% p.a. versus 0.8% p.a.). On average, over the past 30 years, falling agricultural employment has reduced the growth of total employment in Ireland by 1.0% p.a. This is twice as much as the average for either the EC or the OECD generally (-0.5% p.a.) and is five times as much as in the US (-0.2% p.a.).

TABLE 3
**Comparison of Long-run Trends in Non-agricultural Employment
 Growth and Total Employment Growth,
 OECD Countries, 1960-1990**

	Employment Growth (Average % Per Annum)		Difference between Growth of Total Emp. and Growth of Non-Agric Emp. (Percentage Points p.a.)
	Non-Agricultural Employment	Total Employment	
United States	2.1	1.9	-0.2
Canada	2.8	2.4	-0.4
Australia	2.4	2.2	-0.2
Japan	2.1	1.1	-1.0
Germany	0.7	0.3	-0.4
France	1.0	0.4	-0.6
Italy	1.1	0.1	-1.0
Belgium	0.5	0.3	-0.2
Finland	1.8	0.5	-1.3
Sweden	1.3	0.8	-0.5
Ireland	1.3	0.3	-1.0
Peripheral European:			
Greece	2.4	0.3	-2.1
Spain	1.5	0.3	-1.2
EC	0.9	0.4	-0.5
OECD	1.6	1.1	-0.5

Source: Non-Agricultural employment data from OECD Labour Force Statistics, 1960-1971 and 1969-1989. Updated to 1990 using OECD Historical Statistics 1960-1990. Data for Germany taken from OECD International Sectoral Databank and OECD National Accounts. Data on total employment growth are from Table 1. Irish data are from Department of Finance Databank.

It is clear that Ireland's long-run record with respect to employment growth has been significantly influenced by the impact of falling agricultural employment, and that a substantial element of our historic tendency to secure relatively low rates of net employment growth may be attributed to this factor. The significance of the "agricultural" factor has, however, diminished considerably over time, with the fall in the size of the agricultural workforce

worldwide. While outflows from agriculture may, therefore, contribute to an understanding of differences in employment performance between countries at certain times in the *past*, their relevance to *present-day* or *future* employment performance is much less pronounced. The steady diminution in the impact of falling agricultural employment on trends in total employment is documented in Section 2.3 below, where we discuss variations in output and employment performance for different sub-periods of the thirty-year period under review.

2.2.3. Variations within Sub-periods

The long-run data discussed above cover a thirty-year period which has seen dramatic structural changes and considerable variations in both output and employment performance within different sub-periods. These changes have been associated with significant changes in the nature and composition of economic growth and, hence, with the amount of employment growth associated with any given rate of output growth. The relationship between output growth and employment growth is not, therefore, a stable one but has varied considerably over time, both in Ireland and in other countries. To see how the relationship has changed, and to gain some preliminary insights into the factors underlying that change, we consider below data on output and employment performance in selected OECD countries for four distinct sub-periods: 1960-1973; 1973-1979; 1979-1986 and 1986-1990.

2.2.3.1. 1960-1973: Rapid Output Growth with Low Employment Growth

From 1960 to 1973, the average annual rate of economic growth in Ireland was 4.3% (see Table 4). This was a period of strong economic growth generally and Ireland's performance was, in fact, *below* both the EC and OECD averages (4.7% and 4.8% respectively). Output growth in the peripheral European countries was considerably higher than Ireland in this period, with average annual rates of output growth for Spain, Portugal, Greece and Turkey falling in the range of 6-8%. In Japan, the average rate of economic growth was as high as 9.6% per annum.

TABLE 1
Annual Average Growth Rates of Employment and Output,
Selected OECD Countries 1960-1973

	Employment	Output	Employment Intensity ¹
United States	1.9	4.0	0.48
Japan	1.3	9.6	0.14
OECD	1.1	4.8	0.23
EC	0.3	4.7	0.06
Ireland	0.2	4.3	0.05
Peripheral European:			
Spain	0.8	7.2	0.11
Portugal	0.3	6.9	0.04
Greece	-0.6	7.6	N.A
Turkey	1.0	5.9	0.17

¹ Annual average growth in employment as a proportion of the annual average growth in output.

Source: OECD (1992), Historical Statistics 1960-1990 and OECD (1992), *National Accounts*, Volume 1. Irish data as for Figure 1.

The strong output growth in 1960-73 was associated with relatively slow growth in total employment, so that in most countries⁷ the employment-intensity of growth at this time was below (in many cases, substantially below) the thirty-year average which was presented in Table 1. In Ireland, total employment grew by an average of just 0.2% p.a., which was below the EC average (0.3% p.a.) and considerably less than the OECD average of 1.1% p.a. Despite their uniformly strong rates of output growth, the four late-developing economies examined had rather mixed experiences with respect to employment growth at this time: Spain and Turkey achieved quite strong employment growth of 0.8% p.a. and 1.0% p.a. respectively, partly reflecting their rapid output growth rates and partly reflecting an employment-intensity of growth which was considerably in excess of the EC average (although still well below the US and OECD levels). Portugal and Greece, by contrast, had disappointing employment performances, with Greece in particular recording a substantial drop in employment (-0.6% p.a.) despite very rapid rates of economic growth (7.6% p.a.). Ireland falls into the middle of this group of peripheral economies, with relatively slow output growth compared to other late-developing countries and an employment-intensity which was about average for this group of countries.

⁷ Spain and Turkey are exceptions.

Comparison of Non-agricultural Employment Growth and Total Employment Growth Selected OECD Countries 1960-1973

	% Growth Per Annum		Difference between Growth of Total Emp. and Non-Agric. Emp.
	Non-Agricultural Employment	Total Employment	
United States	2.3	1.9	-0.4
Japan	3.0	1.3	-1.7
OECD	1.9	1.1	-0.8
EC	1.1	0.3	-0.8
Ireland	1.7	0.2	-1.5
Peripheral European:			
Spain	2.5	0.8	-1.7
Portugal	1.9	0.3	-1.6
Greece	3.0	-0.6	-2.4
Turkey	3.0	1.0	-2.0

Source: OECD Labour Force Statistics; Data on Total Employment Growth from Table 1. Irish data from Dept. of Finance databank.

The principal factor accounting for the low world-wide employment-intensity of growth during this period was the very strong influence which falling agricultural employment exerted on the trend in total employment at this time. This influence, whose long-run effect on employment-intensity was discussed in Section 2.2, was at its most pronounced during the 1960s, when the numbers leaving the agricultural workforce were very large relative to the size of the non-agricultural workforce. The outflow from agriculture reduced total employment growth rates in all countries at this time, but its impact was particularly large in Ireland and other late-developing economies.⁸ (see Table 5).

Table 5 points to strong growth in non-agricultural employment in all countries, including Ireland, during 1960-1973. The rate of increase in non-agricultural employment in Ireland (1.7% p.a.) was above the EC

average (1.1% p.a.), but was somewhat below the average for the OECD (1.9% p.a.) and was considerably below the rapid growth recorded in Spain (2.5% p.a.), Greece (3.0% p.a.) and Turkey (3.0% p.a.). These results are consistent with Ireland's output growth performance at this time, which, although strong by historical standards, remained below the level achieved in many other countries. It points towards relatively slow output growth in Ireland, rather than a relatively low labour-intensity of growth, as the primary factor underlying Ireland's slower rate of non-agricultural employment growth during this period. More direct comparisons of the employment-intensity of growth outside the agricultural sector are constrained by the lack of data on *output* growth in the non-agricultural sector. Such data as are available support the view that the employment-intensity of Irish economic growth in the non-agricultural sector, while low relative to the US, compared favourably with several other European countries in the 1960s and early 1970s⁹.

1960-1970: How close to the average of the rest of the world was Ireland's employment-intensity?

After the first oil shock there was a widespread slow-down in economic growth, followed by a recovery in the second half of the decade. Average rates of output growth fell to 2.7% p.a. in the OECD (down from 4.8% in 1960-1973), and to 2.5% p.a. in the EC (down from 4.7% p.a.). In Ireland, the fall in output growth was less pronounced (down from 4.3% p.a. in 1960-1973 to 3.4% p.a. in 1973-79), so that Irish economic growth in this period was relatively *high* by international standards. (See Table 6). A large element of the growth in Ireland at this time derived from a pro-cyclical, and ultimately unsustainable, fiscal policy stance adopted in the late 1970s. This change in fiscal policy was marked by a substantial deterioration in the public finances (which moved in National Accounts terms, from net savings of over 1% of GNP in 1971 to a deficit of over 8% of GNP in 1981) and an accompanying deterioration in the current account of the Balance of Payments, from a deficit of 4% of GNP in 1971 to one of 15% in 1981.

⁸ Japan also experienced a severe contraction in agricultural employment at this time. Employment in agriculture fell from 30.2% of total Japanese employment in 1960 to 19.8% in 1968. This compares with a drop from 37.3% to 29.4% in Ireland over the same period.

⁹ Data for 1961-1973 show that the employment-intensity of output growth in the *non-agricultural* sector was 0.38 in Ireland, compared with 0.40 in Finland, 0.15 in Germany and 0.59 in the US.

**Average Annual Growth Rates of Employment and Output,
Selected OECD Countries 1973-79**

	Employment	Output	Employment Intensity ¹
United States	2.5	2.4	1.04
Japan	0.7	3.6	0.19
OECD	1.1	2.7	0.41
EC	0.2	2.5	0.08
Ireland	1.2	3.4	0.35
Peripheral European:			
Spain	-0.7	2.2	N.A
Portugal	2.4	2.9	0.83
Greece	0.6	3.7	0.16
Turkey	N.A	5.3	N.A

¹ Annual average growth in employment as a proportion of the annual average growth in output.

Source: OECD (1992), Historical Statistics, 1960-1990. Irish data as for Figure 1. Peripheral Economies' data from OECD (1992), *Economic Outlook* 51, except Turkey which is from OECD *Historical Statistics*.

The world-wide slow-down in economic growth in 1973-1979 was accompanied by a general rise in employment intensity, so that the decline in employment growth rates was less than proportionate to the fall in output growth. In Ireland, Portugal, Greece and the US, employment growth was actually significantly faster in this period than in the preceding thirteen years, despite lower rates of output growth. Employment growth in Ireland went from 0.2% per annum in 1960-1973 to 1.2% per annum in 1973-1979. The principal factor behind this sharp acceleration was a very rapid growth in employment in non-market services, reflecting the relaxation of Irish fiscal policy (see Section 4 for details). The direct and indirect effects of fiscal expansion in the late 1970s prompted a sharp rise in the employment-intensity of Irish economic growth, bringing it from below the EC average in 1960-1973 to well above that average (and close indeed to the OECD average) in 1973-1979. As will be seen later, this policy-induced rise in labour intensity had its counterpart in a fall in labour intensity in the 1980s, as unavoidable fiscal correction prompted reductions in private sector output and employment, and a cut-back in public sector employment.

A second factor contributing to the general rise in employment-intensity in the late 1970s was the fact that, while agricultural employment was still

declining, its impact on total employment trends was becoming less marked. Table 7 shows that the gap between total employment growth and the growth in non-agricultural employment narrowed substantially between 1960-1973 and 1973-1979. Whereas falling agricultural employment reduced total employment growth rates in Ireland by 1.5 percentage points per annum in the first of these periods, by the late 1970s its impact had fallen to 1 percentage point per annum. It is clear, however, that the significance of the "agricultural factor" remained relatively important for Ireland at this time, so that the growth of non-agricultural employment in Ireland in 1973 to 1979 was even more impressive than the figures on total employment growth suggest. Non-agricultural employment rose in Ireland by 2.2% per annum in 1973-1979, compared with an OECD average of 1.4% per annum and an EC average of just 0.5% per annum.

TABLE 7
Impact of Falling Agricultural Employment on Growth of Total Employment, 1960-1973 Versus 1973-1979

	Reduction in Total Employment Growth ⁺ (Percentage Points Per Annum)	
	1960-1973	1973-1979
United States	-0.4	-0.1
OECD	-0.8	-0.3
EC	-0.8	-0.3
Ireland	-1.5	-1.0

⁺ Difference between annual average growth rate of total employment and growth of non-agricultural employment.

Source: See Table 5

Finally, counter-cyclical trends in labour productivity growth are likely to have played some part in the rise of labour intensity of the late 1970s. "Labour hoarding" during times of economic recession, and the time lag experienced between a slow-down in economic growth and the subsequent reduction of employment, mean that some increase in average employment-intensity is to have been expected at this time.

1979 - 1986: Global Recession

The first half of the 1980s was characterised by worldwide recession, and Ireland's performance was particularly poor. From 1979 to 1986, Ireland's annual rate of growth of GNP was only 0.3%, the lowest in the OECD. (See

table 8). During this period, Ireland experienced a rapid rate of decline in employment of 0.8% per annum, a rate of decline which was exceeded by only one other OECD country, Spain (-1.3% p.a.). Ireland also experienced an exceptionally large rise in unemployment at this time. By contrast, Turkey and Greece both managed to record increases in employment between 1979 and 1986. In the case of Greece, this employment growth occurred despite quite low rates of output growth.

TABLE 8
Average Annual Growth Rates of Employment and Output,
Selected OECD Countries 1979-1986

	% Change Per Annum		Employment Intensity ¹
	Employment	Output	
United States	1.5	2.5	0.60
Japan	0.9	3.6	0.25
OECD	0.8	2.4	0.33
EC	-0.1	1.6	N.A.
Ireland	-0.8	0.3	N.A.
Peripheral European:			
Spain	-1.3	1.6	N.A.
Portugal	N.A.	1.9	N.A.
Greece	1.2	1.5	0.83
Turkey	1.8	4.5	0.41

¹ Average annual growth in employment as a proportion of the average annual output growth.

N.A.: Not applicable.

Source: OECD (1992), Historical Statistics 1960-1990. Irish data as for Figure 1.

The primary factor accounting for Ireland's poor employment performance in the first half of the 1980s was the dramatic reversal of trends in *non-agricultural* employment. Having experienced exceptionally *fast* growth in non-agricultural employment during the 1970s, Ireland went on to become one of only a handful of countries to experience a *decline* in non-agricultural employment in the early 1980s¹⁰. Between 1975 and 1985, non-agricultural employment in Ireland fell by an average of 0.3% p.a.

¹⁰ Other countries which experienced a fall in non-agricultural employment during 1979-85 include Spain (-1.6% p.a.), Belgium (-0.6% p.a.), the UK (-0.6% p.a.) and France (-0.1% p.a.).

During this same period, non-agricultural employment in the EC grew at the modest, but positive, rate of 0.2% p.a., while much stronger growth of 1.0% p.a. was recorded for the OECD as a whole.

The contraction of non-agricultural employment in Ireland during the first half of the 1980s was compounded by a continued decline in the agricultural workforce, thus giving rise to an even larger fall in *total* employment. While the effect of this factor was gradually easing, it continued to hit Ireland more severely than most other countries and served to reduce still further Ireland's (already low) employment ranking in these years¹¹.

The causes of Ireland's poor economic performance in the early 1980s have been analysed in two reports prepared for the Council by Newell and Simmons (1989) and Barry and Bradley (1990). The latter emphasised that the huge swings in Irish fiscal policy in the 1970s and 1980s contributed significantly to the dismal performance of the first half of the 1980s. The expansionary fiscal policies of the 1970s increased employment growth at the cost of a massive build up in the economy's foreign debt. When world interest rates rose sharply at the start of the 1980s, Ireland's debt to GNP ratio accelerated upwards and stabilisation of the economy necessitated a severe fiscal contraction at a time when the world economy was already experiencing a down-turn. The difficulties posed by the global recession were thus profoundly exacerbated in Ireland's case by the need to correct for the inappropriate fiscal policy stance of the late 1970s.

1986 - 1990: Economic Recovery

Over the second half of the 1980s, the Irish economy experienced a strong recovery. From 1986 to 1990, GNP grew by an average of 5% per annum. Employment also recovered and increased by an average of 1% per annum. Ireland was not unique in experiencing a sharp upturn in output and employment growth at this time. The world economy generally entered a period of stronger growth around 1985, and Ireland's recovery was greatly facilitated by the emergence of this more hospitable external environment.

How did Ireland's performance with respect to output and employment growth compare with that of other countries, during the recovery period of

¹¹ In 1979-85, the difference between the growth rate of *total* employment and that of *non-agricultural* employment amounted to an average of -0.7 percentage points per annum in Ireland. This compares with an average difference of -0.3 percentage points for both the EC and the OECD. In the US during this period, total employment grew at the same rate as non-agricultural employment (both at 1.4% p.a.).

the late 1980s. When comparing economic performance over a short period, it is necessary to take account of the fact that different economies will be at different points in their economic cycles. This is significant because typically during the expansionary phase of the cycle, the recovery in employment will lag being the recovery in output. If we compare two economies in a given period, during which one economy was at the start of its recovery cycle, while the other was more advanced into the employment growth phase of the cycle, one would observe an apparent difference in employment performance even if, over the entire cycle, no difference existed.

Ireland experienced strong growth in GNP between 1986 and 1990. To allow for a lag in employment response, we will focus on employment growth from 1987 to 1990 (measured in April of each year). In the E.C. generally, the growth in employment was concentrated in the years from 1985 to 1990. Accordingly we will compare the period 1987 to 1990 in Ireland with the period 1985 to 1990 in other countries. These employment and output figures are shown in Table 9.

In taking these periods, we are comparing Ireland and Europe over the time that each was experiencing its *best* employment performance. In examining the results below, it should be borne in mind that the period of employment expansion in Ireland was *shorter* than in most other countries. Europe managed to sustain increases in employment over several years, whereas Ireland's employment growth was heavily concentrated in just one year (1990). In considering the data in Table 9, it must therefore be remembered that the results have been annualised over only three years for Ireland, whereas for other countries they have been annualised over five years. This can have a not inconsiderable effect in terms of the absolute growth in employment achieved.

Employment growth in Ireland over the period 1987 to 1990 averaged 1.4% per annum. This represented a strong performance relative to historic trends¹² in Ireland and was in line with the annual average rate of employment growth achieved in the EC during its period of strong employment growth (1985-1990). Employment growth in the OECD generally was slightly higher, at 1.6% p.a. Of the peripheral economies, Portugal and Spain experienced particularly strong growth in employment over this period, at 2.1% and 3.0% per annum respectively.¹³

¹² Particularly so, when the growth of *market* employment is considered. (See Section 4).

¹³ Employment growth in the non-market services sector contributed to the strong employment performance of Portugal and, in particular, Spain at this time. See Section 4 for details.

TABLE 9
Average Annual Change in Output and
Employment 1985-1990
Irish Data: 1987-1990¹

	% Per Annum		Employment Intensity ²
	Employment	Output	
United States	1.9	3.0	0.65
Canada	2.3	3.0	0.78
Australia	3.2	2.7	1.18
Japan	1.5	4.6	0.32
Austria	1.1	3.1	0.34
Norway	0.2	1.5	0.10
Finland	0.2	3.4	0.07
Sweden	1.0	2.1	0.46
Iceland	0.9	2.7	0.32
Belgium	1.1	3.2	0.36
Denmark	0.3	1.5	0.22
France	0.6	2.9	0.22
Germany	1.4	3.1	0.44
Italy	0.7	3.0	0.22
Luxembourg	3.3	4.3	0.77
Netherlands	1.7	2.7	0.65
UK	1.8	3.2	0.55
Ireland (1987-1990)	1.4	4.9	0.28
OECD	1.6	3.3	0.50
EC 12	1.4	3.1	0.44
Peripheral European:			
Spain	3.0	4.5	0.67
Portugal	2.1	4.6	0.45
Greece	0.7	1.7	0.42

¹ See text for explanation of different periods used.

² Average annual growth in employment as a proportion of the average annual growth in output.

Source: OECD (1992), *Economic Outlook* 51, Irish data as for Figure 1.

While employment growth in Ireland was on a par with the EC average for similar stages in their growth cycles, *output* growth was considerably higher during the Irish recovery (4.9% p.a.) than in the EC growth phase (3.1% p.a.). Output growth in Ireland during 1987-1990 was higher than in any other OECD country in this period¹⁴. This exceptional rate of economic growth generated an expectation that Irish employment growth should have been capable of not simply *keeping pace with* international norms, but should instead have *exceeded* those norms. In practice, because the employment-intensity of growth in Ireland was low relative to other countries at this time (0.28 compared with an EC average of 0.44), Ireland *required* above-average rates of output growth in order to sustain rates of employment growth which were in line with international trends.¹⁵

An interesting development in this period was a *change* in the output/employment relationship in Europe generally. The growth in employment in the EC from the mid-1980s was higher than in any previous period in the Community's history, despite the fact that output growth was not any stronger than in earlier recoveries. It follows that output growth in the Community became more employment-creating in this period than ever before. Ireland, significantly, did not share in this general European trend.

We will return, in Section 6, to examine the characteristics of Ireland's recent growth and to consider why the rapid output growth in Ireland since 1986 was not associated with an *even-better* employment performance. We turn first (Sections 3 and 4) to a more detailed examination of the performance of the manufacturing and services sectors, to highlight how developments in these sectors have influenced the employment-intensity of Irish economic growth relative to that of other countries. We also examine (Section 5) the traditional gap between the employment-intensity of growth in Europe and the US, and consider why the European employment-intensity has moved closer to the US level since the mid-1980s. The significance of these developments in helping to explain the relatively low employment-intensity of recent Irish economic growth will be discussed in Section 6.

14 Spain and Portugal came close, however, to matching the Irish output growth rates at this time, and sustained their high growth rates over a more protracted period (see Table 9).

15 Uniquely, in the period 1987-90, trends in agricultural employment did not contribute towards Ireland's relatively low employment-intensity of growth. This is because a small *rise* in agricultural employment was recorded in Ireland in these years. This rise was not repeated in subsequent years and the last two years have seen a resumption of the normal pattern, with growth in total employment (0.0% p.a. for 1990-92) lagging behind the growth in non-agricultural employment (0.8% p.a.)

3. THE IMPACT OF MANUFACTURING INDUSTRY

The relationship between economic growth and employment growth in Ireland is heavily influenced by the increasing significance of industry in the composition of output and by changes in employment intensity within the manufacturing sector. The sheer size of the industrial sector makes it worthy of detailed examination: in 1991, industry accounted for 43% of GDP, up from 32% in 1964¹⁶. The sector thus exerts an increasingly dominant influence on the overall measured growth rate of the economy. At the same time, the level of employment intensity obtaining in the sector (i.e. the amount of labour employed per unit of output) carries increasing weight in calculations of aggregate employment intensity for the economy as a whole. This section reviews trends in output/employment relationships within Irish manufacturing industry, within both an historical (i.e. relative to past trends) and a comparative (i.e. relative to other western economies) perspective.¹⁷ It aims in particular to establish the extent to which Ireland's experience has differed from international norms, and to identify where such differences lie.

3.1 Relationships Between Output Growth and Employment Growth in OECD Manufacturing Industry: The Record Since 1970

Table 10 shows annual average growth rates of manufacturing output, employment and productivity during the period 1970 to 1989, for the 15 OECD countries for which data are available. Over the full 20-year period, Ireland ranks second (after Japan) in terms of output growth, second (again after Japan) in terms of productivity growth and is one of only three countries (along with Japan and Canada) which has achieved a net gain in manufacturing employment. These rankings are illustrated in Figure 1 of Appendix 1. The aggregate data would thus appear to position Irish manufacturing industry alongside the Japanese, as being a sector of high output growth, high productivity growth and limited (but positive) employment growth. This compares favourably with the typical OECD profile for the period, which was one of low output growth (c. 2% per annum), modest productivity growth and declining employment.

16 Industry here includes manufacturing, building and construction. Industry's share has been measured here as a proportion of GDP at constant factor cost. The rise in industry's share would be somewhat smaller, if measured in current prices.

17 The primary focus in this section is on the relationship between manufacturing output growth and employment generated within the manufacturing sector itself. The indirect employment effects of manufacturing output growth on jobs *outside* the manufacturing sector are discussed briefly in paragraph 3.3 below. Outside of this paragraph the text refers exclusively to employment arising *within* manufacturing industry.

Average Annual Growth Rates of Manufacturing Output (Vol.),
Employment and Productivity, OECD Countries.
Period: 1970 - 1989 % Change per Annum

	Manufacturing Output ¹ (Vol.)	Manufacturing Employment	Output Per Employee
USA ²	+3.1	-0.1	+3.2
CANADA	+3.1	+1.0	+2.1
JAPAN ³	+6.2	+0.2	+6.0
GERMANY	+1.5	-0.8	+2.3
FRANCE	+2.1	-1.1	+3.2
ITALY	+4.2	-0.3	+4.5
UK ³	+0.8	-2.4	+3.2
AUSTRALIA ³	+2.0	-0.4	+2.4
NETHERLANDS ³	+2.1	-1.6	+3.7
BELGIUM ³	+2.7	-2.2	+4.9
DENMARK	+2.1	-0.4	+2.5
NORWAY ³	+1.0	-1.0	+2.0
SWEDEN	+1.6	-0.5	+2.1
FINLAND	+3.7	-0.3	+4.0
IRELAND ⁴	+5.6	+0.1	+5.5

¹ GDP arising in manufacturing at constant prices

² 1970 - 1987

³ 1970 - 1988

⁴ Irish data relate to Transportable Goods sector (ie. include mining, quarrying and turf).

Source: OECD International Sectoral Databank; Irish data on GDP arising in Transportable Goods Industries supplied by CSO, employment data from Labour Force Surveys.

More detailed examination of the underlying annual data reveals a sharp distinction between the 1970s and the 1980s, pointing to the need to break the data into at least two sub-periods: 1970-1979 and 1979-1989. This is done in Table 11 below. Already in the 1970s, Ireland was experiencing relatively rapid output growth in the manufacturing sector, at 5.3 per cent per annum. Only Italy and Japan had faster output growth rates at this time.¹⁸ Productivity growth (at 3.8 per cent per annum) was in the middle of the range, well behind countries like Japan, Belgium and Italy, but ahead of the

¹⁸ Figures 2 and 3 of Appendix 1 illustrate the rankings implied by the data given in Table 11.

U.K., Scandinavian and North American economies. This high output growth combined with moderate productivity growth resulted in Ireland having the second highest growth rate of manufacturing employment in the 1970s (after Canada).

The 1980s saw a change of behaviour throughout the OECD, but particularly in Ireland. Moreover, the direction of change in Ireland differed from the general trend, thus opening up a gap between Ireland and other western economies: the overall picture for OECD manufacturing industry after 1979 was of slower growth in output and productivity, and falling manufacturing employment. Ireland, by contrast, experienced a small rise in the rate of manufacturing output growth, accompanied by a near doubling of the rate of productivity growth (up from 3.8 per cent per annum in 1970-79 to 7.2 per cent per annum in 1979-89). The corollary was that, while Ireland once again ranked near the top of the fifteen countries examined in terms of manufacturing output growth in the 1980s, its employment performance (-1.2% per annum) was only about average for the group. Countries like Denmark and Canada managed to achieve positive growth in manufacturing employment during the 1980s despite having much lower output growth rates (see Figure 3, Appendix 1)¹⁹

The salient features of Irish manufacturing performance over the past two decades may be summarised as follows: the sector has consistently performed well in terms of output growth relative to other OECD countries. Ireland's standing in this regard, which was already good in the 1970s, improved still further in the 1980s. This was partly due to a slightly improved output performance by Irish manufacturing itself, and partly due to a fallback in output growth among other countries.

¹⁹ A brief statistical analysis in the OECD Employment Outlook (1989) examined output/employment relationships in manufacturing industry in a range of OECD countries over the period 1957-1987. It found that the long-run responsiveness of manufacturing employment to output growth was generally greater in the 1980s than in earlier periods. Ireland stands out, however, as a notable exception to this trend, with a significant drop in employment responsiveness in the 1980s. This is in line with the general results presented here.

TABLE 11

Average Annual Growth Rates of Manufacturing Output (Vol.), Employment and Productivity, OECD Countries.
Period: 1970 - 1979 and 1979 - 1989
% Change per Annum

	Period: 1970-1979			Period 1979-1989 ²		
	Manufacturing Output	Manufacturing Employment	Output per Employee	Manufacturing Output	Manufacturing Employment	Output per Employee
USA	3.6	1.0	2.6	2.4	-1.2	3.6
CAN	4.4	1.8	2.6	1.9	0.3	1.6
JAPAN	5.6	-0.6	6.2	6.7	0.9	5.8
GER	2.3	-1.3	3.6	0.8	-0.4	1.2
FR	4.0	-0.1	4.1	0.4	-2.1	2.5
ITALY	5.8	1.0	4.8	2.7	-1.5	4.2
UK	0.7	-1.5	2.2	0.8	-2.9	3.7
AUSTRAL	2.0	-0.7	2.7	2.0	-0.2	2.2
NL	2.4	-2.2	4.6	1.8	-1.0	2.8
BEL	3.3	-2.2	5.5	2.2	-2.2	4.4
DEN	2.8	-1.5	4.3	1.5	0.5	1.0
NOR	1.7	-0.1	1.8	0.3	-1.8	2.1
SWED	1.3	-0.8	2.1	2.0	-0.3	2.3
FIN	3.7	0.8	2.9	3.7	-1.3	5.0
IRL ¹	15.3	1.5	3.8	6.0	-1.2	7.2

¹ Irish data relate to the Transportable Goods sector (ie. include mining, quarrying and turf).

² 1979 - 1987 for US; 1979 - 1988 for Japan, UK, Australia, NL, Belgium and Norway.

The picture with respect to manufacturing employment growth is quite different, reflecting the dramatic rise in the rate of Irish manufacturing productivity growth during the 1980s, both in absolute terms and relative to other countries. During the period 1979 - 1989, the rate of growth in Irish productivity was substantially above even those of traditionally high productivity growth economies, such as Japan. The effect of this was that *a given rate of growth of manufacturing output in Ireland in the 1980s produced substantially fewer jobs in manufacturing than in any other country examined*. What are the factors underlying the phenomenal rates of productivity growth in Irish manufacturing in the 1980s; how should they be interpreted; and what do they suggest about future relationships between economic growth and employment growth in the Irish economy?

3.2 The Causes of Rapid Productivity Growth in Irish Manufacturing Industry

While many of the factors which contributed to the rise in Irish manufacturing productivity in the 1980s formed part of a wider, global trend, some of the underlying causes were unique to Ireland or, more typically, were particularly pronounced here. Three of the more important contributory factors are considered below, namely:

- (i) The extent and impact of structural change;
- (ii) The effect of transfer pricing; and
- (iii) The extent of productivity growth within existing sectors of manufacturing industry.

(i) The Impact of Structural Change

Changes in the structure of industrial output constitute an important mechanism through which average productivity levels for the manufacturing sector are raised. This is true not just for Ireland, but for all countries. A recent OECD Study (1992a) on Structural Change and Industrial Performance in 7 major economies suggested that the *ideal* industrial mix for a country was one that was shifting towards high-growth industries, had little or no increase in medium-growth industries and was shedding low-growth industries. It went on to show that the relative growth rates of different industrial sectors since the 1960s have been closely correlated with the level of technology employed, so that the high growth industries have in fact been high-tech industries, and so on.²⁰ On this criterion, Ireland has performed exceptionally well, with the past two decades showing substantial shifts in industrial structure along the lines prescribed.

Table 12 shows how the composition of manufacturing value-added has changed in Ireland since 1975. The increasing dominance of high-tech sectors, driven largely by pharmaceuticals and office and data processing, is immediately striking. These sectors increased their share of total manufacturing

²⁰ The study defined high-tech industries as comprising pharmaceuticals, computers and office machinery, electrical machinery, communications and semi-conductors, and aero-space and instruments. Low-tech industry comprised food, drink and tobacco; textiles, footwear and leather; wood, cork and furniture; paper and printing; petroleum refining; stone, clay and glass; ferrous metals; fabricated metal products; and ship building. The medium-tech sector comprised the balance of manufacturing industry (principally the non-pharmaceutical components of the chemical sector and the more "basic" elements of the metal and engineering sector). This classification corresponds very closely to the categories adopted in the remainder of this paper, which proved easier to adapt to available EC data.

value added from 9.8% in 1975 to 40.1% in 1989. Their growing importance has its counterpart in a declining proportion of value-added coming from both the medium-tech and, more significantly, the low-tech sectors.

TABLE 12
Composition of Manufacturing Gross Value Added;
Ireland 1975 -1989

	% Total Gross Value Added		
	1975	1980	1989
HIGH-TECH	9.8	19.6	40.1
Pharmaceuticals	1.7	6.3	12.3
Office + Data Processing	1.5	4.8	13.4
Electrical Engineering	3.7	5.7	10.1
Instrument Engineering	2.9	2.8	4.3
MEDIUM-TECH	15.8	17.5	11.9
Preliminary Metal Processing	1.4	0.8	0.7
Chemicals (excluding Pharmaceuticals)	6.0	6.5	4.4
Mechanical Engineering	1.8	2.5	2.5
Motor Vehicles	1.8	2.5	0.4
Other Transport	1.4	1.0	0.4
Miscellaneous Industries	3.4	4.2	3.5
LOW-TECH	74.7	62.9	48.1
Non Metallic Minerals	8.7	6.8	4.8
Metal Articles	3.8	4.3	2.1
Food, Drink & Tobacco	42.9	38.0	32.1
Textiles	5.6	3.7	2.1
Clothing, Footwear & Leather	5.6	3.4	1.5
Timber & Wooden Furniture	1.7	1.4	1.2
Paper & Printing	6.4	5.3	4.3
Total Manufacturing Industries¹	100.0	100.0	100.0

¹ Totals may not sum to 100 due to rounding.

Source: Census of Industrial Production, Appendix 4, Enterprise Survey Results.

Note: Data relate to industrial enterprises employing 20 or more persons. Gross value added is measured at market prices. 1975 is the first year for which enterprise survey results are available.

Differences in productivity levels across the three main categories of industry mean that substantial changes in aggregate productivity may be achieved by structural change alone, even if the level of productivity in each individual sub-sector of industry remains unchanged. Table 13 shows that productivity levels in high-tech industry in 1989 were over twice that of the low-tech sectors, and the gap between the three categories of industry has widened significantly over time.²¹ A crude indication of the significance of structural change in Irish manufacturing industry is given by the fact that, if the structure of manufacturing employment had remained unchanged between 1980 and 1989, the level of productivity at the end of the period would have been about 15% lower than it actually was. This suggests that structural change itself accounted for productivity growth of the order of 1.5% per annum in Ireland over the period 1980 - 1989, a figure in line with the total growth rate of manufacturing productivity in many OECD countries at the time.²²

Two factors have served to increase the impact of structural change on productivity growth in Irish manufacturing industry, relative to that experienced in other countries. First, the *extent* of structural change experienced in Ireland during the 1980s far exceeds that which has occurred in other EC countries.²³ Second, the *gap in productivity levels* between high-tech and low-tech industries is exceptionally wide in Ireland, thus accentuating the impact of any given change in structure. These two phenomena are apparent from Tables 14 to 18 below, which show changes in the structure of manufacturing employment and value added in EC countries between 1980 and 1988, distinguishing between high, medium and low-tech industries.

21 There is strong evidence that productivity levels in the low-tech category have been artificially inflated by transfer pricing in the miscellaneous foods industry since the mid-1980s. If this were corrected for, the ratio of productivity levels in high-tech and low-tech industry in 1988 would be further increased. Arguably, however, this could not be done without also adjusting the productivity data for high-tech industry to abstract from the impact of transfer pricing there. For further discussion of this issue, see Section 3.2 (ii) below.

22 The methodology adopted here follows that employed by Keating and Keane (1988/89: 216). The structural effect is calculated as $\frac{\sum e_{89} O_{89}}{\sum e_{80} O_{89}}$

where $\sum e_{89} O_{89}$ equals gross value added per employee in manufacturing industry in 1989, and $\sum e_{80} O_{89}$ corresponds to what gross value added in manufacturing industry *would have been* in 1989, had the structure of manufacturing employment remained as it was in 1980. The level of disaggregation applied was as shown in Table 12 (i.e. 14 subsectors).

23 Data for the US are available from OECD National Accounts but are not directly comparable with the Eurostat data presented in Tables 14 to 18. They are, however, useful in giving an indication of the direction and extent of structural change in US manufacturing industry during the 1970s and 1980s. The inclusion of US data would not alter the general conclusions arrived at here.

Productivity Levels in Irish Manufacturing Industry 1975 - 1989

	Gross Value Added per person engaged £000, Current Prices		
	1975	1980	1989
HIGH-TECH	16.3	18.3	75.3
Pharmaceuticals	11.4	58.8	154.5
Office + Data Processing	10.4	30.1	137.2
Electrical Engineering	3.9	10.3	39.1
Instrument Engineering	9.4	11.3	44.4
MEDIUM-TECH¹	5.1	12.1	31.9
Preliminary Metal Processing	4.2	8.2	34.1
Chemicals (excluding Pharmaceuticals)	7.7	18.5	50.0
Mechanical Engineering	4.0	8.6	28.1
Motor Vehicles	3.9	13.5	26.5
Other Transport	5.3	11.2	23.7
Miscellaneous Industries	4.3	9.6	24.5
LOW-TECH¹	5.4	11.3	35.8
Non Metallic Minerals	7.1	12.7	36.7
Metal Articles	3.7	7.9	18.7
Food, Drink & Tobacco	7.6	16.3	54.9
Textiles	3.3	5.9	15.5
Clothing, Footwear & Leather	2.6	4.5	9.9
Timber & Wooden Furniture	2.9	6.5	19.0
Paper & Printing	4.2	9.2	25.9
Total Manufacturing Industries	5.4	12.4	44.5
Ratio of Productivity Levels in High-Tech relative to Low-Tech	1.17	1.62	2.10

¹ Weighted Average.

Source: See Table 12.

Note: See Table 12.

TABLE 14
Changing Structure of EC Manufacturing Industry
Share of Employment in High-Tech, Medium-Tech and
Low-Tech Sectors, 1980 and 1988.

		% Total Manufacturing Employment											
		BEL	DEN	GER	FR	IRL	IT	NL	UK	SP	PORT	GR	
High-Tech	1980	13.1	13.0	18.1	14.9	13.3	13.6	N.A	14.2	N.A.	N.A.	N.A	
	1988	11.9 ¹	14.8	20.4	16.9	22.7	15.9	18.6	16.1	7.9	6.4	7.7	
Medium-Tech	1980	41.1	33.1	42.4	38.0	17.9	40.2	N.A	40.2	N.A	N.A.	N.A	
	1988	41.4 ¹	30.6	45.7	36.5	16.2	36.3	32.6	35.6	28.0	16.7	21.6	
Low-Tech	1980	45.8	53.9	39.5	47.1	68.7	46.2	N.A	45.6	N.A	N.A	N.A	
	1988	46.7 ¹	54.6	33.9	46.6	60.9	47.8	48.8	48.3	64.2	76.9	70.7	

¹ Figures for all countries relate to industrial enterprises (ie >20 employees) 1987 Data.

Source: Eurostat, Structure and Activity of Industry 1980/81 and 1987/88, Luxembourg. Irish data are taken from CSO, Census of Industrial Production 1988, Appendix 4.

Notes: **High-Tech** = Pharmaceuticals, Office + D.P., Electrical Engineering, Instrument Engineering.

Medium-Tech = Production and Preliminary Processing of Metals, Chemicals, Mechanical Engineering, Motor Vehicles, Other Transport, Rubber and Plastics, Other Manufacturing.

Low-Tech = Non-metallic Minerals, Metal Articles, Food, Drink and Tobacco, Textiles, Leather and Leather Goods, Footwear and Clothing, Timber and Wooden Furniture, Paper and Printing.

TABLE 16
Structure of EC Manufacturing Industry
Share of Value added in High-Tech, Medium-Tech and
Low-Tech Sectors, 1980 and 1988

		% Total Manufacturing Employment										
		BEL	DEN	GER	FR	IRL	IT	NL	UK	SP	PORT	GR
High-Tech	1980	13.0	12.8	18.5	16.4	19.6	14.1	N.A	15.4	N.A	N.A	N.A
	1988	12.2 ²	15.8	20.8	18.8	37.2	15.9	17.4	17.4	9.2	8.1	7.2
Medium-Tech	1980	46.1	32.8	45.5	40.0	17.5	41.5	N.A	40.1	N.A	N.A	N.A
	1988	52.5 ²	29.7	48.7	39.7	12.0	37.5	41.2	39.2	35.1	23.6	29.0
Low-Tech	1980	40.9	54.4	36.0	43.6	62.9	44.4	N.A	44.5	N.A	N.A	N.A
	1988	35.3 ²	54.5	30.5	41.5	51.9	46.6	41.4	42.4	55.7	68.3	63.8

1 Value-added data for Ireland and Portugal relate to gross value-added at market prices. All other data relate to gross value added at factor cost.
2 1987 Data.

Source: See Table 14

Note: See Table 14

Changes in the structure of manufacturing employment, which are shown in Tables 14 and 15, provide a reliable indicator of the underlying pace of structural change in EC manufacturing industry. This is because they are not subject to the distorting effects of transfer pricing (see section (ii) below), which complicates the interpretation of value added data. Table 14 shows that, in 1980, Ireland already possessed quite a well-developed high-tech sector, with 13.3% of total manufacturing employment concentrated in these industries. Ireland is significantly under-represented in the medium-tech industries, and is unique in the EC in having a relatively high proportion of manufacturing employment in both the high-tech (22.7% in 1988) and low-tech categories (60.9% in 1988).

TABLE 15
Changing Structure of EC Manufacturing Industry Change in
Employment Shares 1980 - 1988
Percentage Points

	BEL	DEN	GER	FR	IRL	IT	UK
High-Tech	-1.2	+1.8	+2.3	+2.0	+9.4	+2.3	+1.9
Medium-Tech	+0.3	-2.5	+3.3	-1.5	-1.7	-3.9	-4.6
Low-Tech	+0.9	+0.7	-5.6	-0.5	-7.8	+1.6	+2.7

Source: See Table 14.

Note: See Table 14.

Table 15 shows that the extent of change in manufacturing employment shares between 1980 and 1988 was significantly greater in Ireland than in other EC countries. The share of Irish manufacturing employment in high-tech industries rose by 9.4 percentage points during the period, compared with around 2 percentage points in most other countries. The vast majority of the Irish shift came from movements out of the low-tech sectors (-7.8 percentage points), although this is not surprising given the relatively insignificant role of medium-tech industries in Ireland. The pattern for other EC countries has been one of smaller changes, and a more diverse picture regarding the fate of the low-tech sectors: in four of the seven countries presented in Table 15, the employment share of low-tech industries actually *increased* over the period.²⁴

²⁴ Note that an increase in employment share need not imply a rise in absolute employment levels in the sector, because total manufacturing employment was declining in most EC countries during this period - see section 3.1 above.

Turning now to the data on manufacturing value added, the figures confirm the same broad trends outlined above but in a more exaggerated fashion. In 1980, 19.6% of the manufacturing value added in Ireland came from the high-tech sectors, placing it even then at the top of the EC league. By 1988, this share had risen to 37.2%, substantially ahead of even the next highest EC country (Germany, at 20.8%). Once again, the "dualism" of Irish manufacturing industry stands out, with a relatively high proportion of value added coming from both the high-tech and the low-tech sectors. This "gap" in industrial structure in the medium-tech sectors is not apparent in any other EC country.

TABLE 17

Changing Structure of EC Manufacturing Industry Change in Value Added Shares, 1980 - 1988 Percentage Points

	BEL	DEN	GER	FR	IRL	IT	UK
High-Tech	-0.8	+3.0	+2.3	+2.4	+17.6	+1.8	+3.0
Medium-Tech	+6.4	-3.1	+3.2	-0.3	-5.5	-4.0	-0.9
Low-Tech	-5.6	+0.1	-5.5	-2.1	-11.9	+2.2	-2.1

Source: See Table 14.

Note: See Table 14.

Table 17 shows how the share of manufacturing value added coming from the three main categories of industry has changed in EC countries between 1980 and 1988. The extent of change in the structure of Irish value added over such a relatively short-time period is quite dramatic and far exceeds anything seen in other EC countries. Over the eight years surveyed, the proportion of manufacturing value added coming from high-tech sectors rose by 17.6 percentage points in Ireland, compared with a general EC rise of between 2 and 3 percentage points. About two thirds of the Irish shift was accounted for by a decline in the proportion of value added coming from the low-tech sectors which fell by 11.9 percentage points over the period.

The gap between productivity levels in high-tech, medium-tech and low-tech industries in the EC countries in 1980 and 1988 is shown in Table 18. It is this gap which makes it possible for structural change, in and of itself, to alter average productivity levels in the manufacturing sector. The summary statistic at the bottom of Table 18 expresses productivity levels in high-tech industry as a percentage of productivity levels in low-tech industry for each EC country in 1988.

TABLE 18
Ratio of Value-Added Shares to Employment Shares,
EC Industry, 1980 and 1988
Value Added Share as % Employment Share

	BEL	DEN	GER	FR	IRL	IT	NL	UK	SP	PORT	GR
High-Tech	0.99	0.98	1.02	1.10	1.47	1.04	N.A	1.08	N.A	N.A	N.A
	1.03	1.07	1.02	1.11	1.64	1.00	0.94	1.08	1.16	1.27	0.94
Medium-Tech	1.12	0.99	1.07	1.05	0.98	1.03	N.A	1.00	N.A	N.A	N.A
	1.27	0.97	1.07	1.09	0.74	1.03	1.26	1.10	1.25	1.41	1.34
Low-Tech	0.89	1.01	0.91	0.93	0.92	0.96	N.A	0.98	N.A	N.A	N.A
	0.76	1.00	0.90	0.89	0.84	0.97	0.85	0.88	0.87	0.88	0.90
Productivity Levels in High-Tech Ind. as % Low-Tech Industry, 1988	1.36	1.07	1.13	1.25	1.95	1.03	1.11	1.23	1.33	1.44	1.04

Source: Derived from Tables 14 and 16.

Note: Figures below 1.00 suggest that productivity levels are below the manufacturing industry average in that country. Figures above 1.00 point to above-average productivity levels.

It shows that the gap between productivity levels is substantially higher in Ireland (at 95% in 1988) than in any other EC country. Taking a simple average of the figures shown, the average gap in 1988 for the EC 12 is seen to be only about 16%. A shift in industrial structure from low-tech to high-tech industries would thus have a far greater impact in raising average productivity levels in Irish manufacturing industry than in the EC generally.

The existence of an exceptionally wide productivity differential between high-tech and low-tech industry in Ireland, and the fact that Ireland experienced significantly above-average change in the structure of its manufacturing sector during the 1980s, testify to the 'dual' nature of Ireland's industrial growth. High-tech industry in Ireland is dominated by overseas-owned companies, which accounted for 96.5% of net output and 84.6% of employment in this segment in 1989. Productivity levels in these foreign companies are *high* by international standards reflecting, among other things, the fact that they are concentrated in relatively fast-growing areas of high-tech industry and the fact that they represent in the main the more successful elements of U.S. and international industry. By contrast, the low-tech sectors of Irish industry derive most of their characteristics from the *indigenous* industrial base²⁵. Irish-owned industry is heavily concentrated in this segment, with 76% of its net output and a similar proportion of its employment classified as low-tech (see Table 19). Productivity levels among Irish-owned firms are *low* by international standards (see subsection (iii) below), thus accentuating the gap in productivity levels between high-tech and low-tech industry. These underlying features of Ireland's industrial structure provide part of the explanation for the relatively large productivity differential between high-tech and low-tech industry in Ireland. The differential has been further increased by the impact of transfer pricing, an issue which is discussed in detail in subsection (ii) below.

25 Note, however, that the low-tech sectors include a substantial, and growing, overseas presence, so that the dichotomy between overseas-owned, high-tech industry and Irish-owned, low-tech industry may need to be qualified in the future. In 1989, overseas-owned companies accounted for 48.1% of net output and 29.4% of employment in low-tech industry. The high output share relative to employment reflects, in part, the very high net output per employee recorded by overseas firms in the 'Other Food' category of industry. (see subsection (ii) below for discussion). The employment share (29.4%) provides a good, base-line estimate of the extent of the overseas presence in low-tech industry.

TABLE 19
Structure of Irish-Owned Industry 1983 and 1989

	% Total Irish-Owned Industry			
	Employment		Net Output	
	1983	1989	1983	1989
High-Tech ¹	3.7	5.9	3.5	4.8
Medium-Tech ¹	14.6	18.0	13.1	19.3
Low-Tech ¹	81.7	76.1	83.4	75.9
Total Irish Owned	100.0	100.0	100.0	100.0

¹ For details of categories, see Table 12.

Source: Census of Industrial Production.

The main impetus to structural change in Ireland's manufacturing sector came, not from any exceptional pace of change in the *indigenous* industrial base, but rather from the attraction to Ireland of large volumes of foreign direct investment. Much of this investment was concentrated in the pharmaceuticals and office and data processing sectors²⁶, thus enabling an entirely new, high-tech sector to be "grafted on" to Ireland's industrial structure, at a pace which would not otherwise have been possible. Table 19 suggests that the extent of change in the structure of *Irish-owned* industry over the period 1983-1989²⁷ was roughly in line with that of other EC countries (see Tables 14-17 above for comparison). Moreover, much of the change documented in Table 19 was brought about as a result of the *contraction* of low-tech industry, particularly in the early part of the period, rather than as a result of any exceptional growth in the other categories of Irish-owned industry²⁸. Given the starting position of Irish-owned industry in 1983, with an exceptionally high degree of concentration in low-tech

26 Evidence for other countries shows that the structure of foreign investment in Ireland is very typical of the pattern found elsewhere. It reflects *global* trends in the structure of mobile investment flows, rather than any deliberate policy of targeting high-tech sectors. Moreover, the extent of concentration of overseas industry in high-tech sectors should not be exaggerated: In 1989, 57.9% of the net output of overseas industry came from high-tech sectors, 11.1% from medium-tech and 31.1% from low-tech (19.1%, if the 'Other Food' category is excluded). In employment terms, the distribution of overseas industry in Ireland is quite evenly balanced, with 40.0% of overseas employment in high-tech sectors, 21.0% in medium-tech and 39.0% in low-tech (35.9%, excluding 'Other Food').

27 1983 is the first year for which a nationality breakdown is available from the Census of Industrial Production.

28 Employment in Irish-owned industry fell from 119.5 thousand in 1983 to 104.8 thousand in 1989. This fall was made up of a decrease of 17.9 thousand in low-tech industry, partially offset by increases of 1.4 thousand and 1.5 thousand in medium and high-tech industry respectively.

industry, a faster-than-average rate of structural change among Ireland's indigenous base might have been expected.

(ii) The Impact of Transfer Pricing

There can be little doubt but that the productivity data for Irish manufacturing industry are artificially inflated by transfer pricing practices carried out by some multi-national corporations. The objective of transfer pricing is to optimise the global distribution of profits within a multi-national organisation, so as to minimise the overall corporate tax bill. In practice, this means locating as much as possible of the company's global profits in a low tax location, such as Ireland. This can be done by pricing inputs at less than arm's length price and/or valuing output at more than the market price. The effect of this would be to raise the net output figures for the manufacturing sector (because the profit element is contained in this component of manufacturing output), and to raise recorded productivity levels (because this is measured in terms of net output per employee).

Transfer pricing, by its nature, is a hidden activity, so that precise quantification of its significance in Ireland is impossible. It is clear, however, that conditions in Ireland provide an opportunity to engage in such practices and that the observed characteristics of the industrial output data support the view that transfer pricing occurs.²⁹ In order for transfer pricing to occur, a country must offer relatively low rates of corporation tax by international standards and must also have a substantial body of multi-national organisations operating within its borders, which are capable of switching profits between different global locations. Ireland fulfils both of these conditions:³⁰ Its 10% rate of corporate tax for manufacturing industry (which replaced an even lower *zero* rate of export profit tax in 1991) is low by international standards. Moreover, the level of foreign direct investment by multi-national corporations in Ireland is unusually high.³¹

²⁹ Foley (1991) presents a detailed discussion of the theoretical and empirical evidence on transfer pricing.

³⁰ The co-existence of these two features is not, of course, fortuitous: low corporate tax rates have been used in Ireland since 1958 as one of the key policy instruments to attract foreign direct investment.

³¹ A recent study by the EC Commission (1991: 58) describes Ireland as having "one of the highest levels of foreign participation in its manufacturing sector of any EC country". In fact, those countries for which details of foreign involvement are provided (UK, Portugal, Germany, France) fall very far behind Ireland in terms of the extent of overseas investment. Similarly, NESC Report No. 93 (forth-coming) confirms that Ireland is exceptional in the degree of foreign involvement in its manufacturing sector.

TABLE 20
Contribution of Overseas Firms to
Manufacturing Net Output
in Ireland 1983 and 1989

	Net Output of Overseas Firms as % of Total MFG. Net Output	
	1983	1989
HIGH-TECH¹	95.4	96.5
Pharmaceuticals	98.1	98.5
Office + Data Processing	98.4	98.7
Electrical Engineering	86.4	92.7
Instrument Engineering	98.0	97.4
MEDIUM-TECH¹	53.7	56.6
Preliminary Metal Processing	29.6	14.8
Chemicals (excluding Pharmaceutical)	60.0	69.2
Mechanical Engineering	59.8	67.3
Motor Vehicles	27.5	44.2
Other Transport	22.6	8.2
Miscellaneous Industries	67.6	63.0
LOW-TECH¹	35.4	48.1
Non Metallic Minerals	35.5	46.8
Metal Articles	30.9	34.7
Food, Drink & Tobacco (excluding other food)	29.0	39.6
Other Food	77.2	90.8
Textiles	53.4	72.9
Clothing, Footwear & Leather	31.6	28.6
Timber & Wooden Furniture	11.3	17.7
Paper & Printing	11.9	12.8
Total Manufacturing Industries¹	58.1	69.4

¹ Weighted Averages.

Source: CSO, Census of Industrial Production, Table 6.

Note: A number of establishments in the 1983 census were not classified as either foreign or Irish. These have been treated as Irish for the purpose of this table.

Table 20 highlights the dominant role played by overseas industry in the Irish manufacturing sector. Two points stand out: the first is the sheer magnitude of the overseas presence. In 1989, overseas industry accounted for 69.4% of total manufacturing net output, up from an already high level of 58.1% in 1983. Second, the breadth of overseas involvement is quite striking. Overseas domination of the high-tech sectors has already been well documented: overseas firms accounted for 96.5% of total net output of high-tech industry in 1989, and their domination of all four of these rapidly growing sub-sectors is now virtually complete. Overseas firms also account, however, for a substantial proportion of net output in both the medium-tech and low-tech sectors (56.6% and 48.1% respectively in 1989).³²

The belief that transfer pricing may lie behind some of the very rapid growth of Irish manufacturing productivity in the 1980s stems from the exceptionally high levels of productivity recorded in certain sectors of overseas-owned industry. Sectoral data for Ireland on net output per person engaged are presented in Table 21, distinguishing between overseas and Irish owned establishments. Average productivity among overseas manufacturing firms in 1989 was 2.8 times that of Irish-owned industry. A higher level of productivity among overseas firms is to be expected, for reasons already outlined in subsection (i) above.

Moreover, the *gap* in productivity levels between Irish and Overseas industry reflects in part the poor productivity of many indigenous industries, rather than any exceptional behaviour by overseas companies (see (iii) below). Despite this, three sectors of overseas industry stand out as having particularly high levels of net output per head: these are the pharmaceutical sector (£200.1k per employee), office and data processing (£168.9k) and the "other food" category (£269.7k). These figures compare with an average for all overseas manufacturing industry of £71.1k per employee and only £25.4k for Irish industry.³³

³² The contribution of overseas firms to net output in the low-tech sector is increasingly influenced by overseas domination of the rapidly expanding "other food" category. In 1989, "Other Foods" accounted for 20.5% of total net output of the low-tech category and 9.2% of total manufacturing net output. See main text for discussion.

³³ Well over 90% of the difference in net output per employee in these sectors is accounted for by differences in the non-wage element of net output (i.e. remainder of net output).

TABLE 21
Net Output per Person Engaged in Irish Manufacturing
Industry, 1989, Distinguishing between Overseas
and Irish-Owned Firms

	Net Output per Person (£000)		
	Overseas Industry	Irish-owned Industry	Overseas as % Irish
HIGH-TECH	103.0	20.8	495.2
Pharmaceuticals	200.1	25.3	790.9
Office + Data Processing	168.9	38.3	441.0
Electrical Engineering	69.7	18.6	374.7
Instrument. Engineering	47.9	20.9	229.2
MEDIUM-TECH	37.5	27.1	138.4
Preliminary Metal Processing	41.2	36.1	114.1
Chemicals (excluding Pharmaceuticals)	50.0	47.5	105.3
Mechanical Engineering	37.1	21.5	172.6
Motor Vehicles	39.7	11.7	339.3
Other Transport	27.3	30.8	88.6
Miscellaneous Industries	29.3	24.4	120.1
LOW-TECH	56.7	25.4	223.2
Non Metallic Minerals	59.8	30.0	199.3
Metal Articles	25.9	18.6	139.2
Food, Drink & Tobacco (excluding "Other Food")	40.0	33.6	119.0
"Other Food"	269.7	20.7	1302.9
Textiles	18.5	16.1	114.9
Clothing, Footwear & Leather	11.2	11.8	94.9
Timber & Wooden Furniture	43.5	16.5	263.6
Paper & Printing	30.6	28.3	108.1
Total Manufacturing Industries	71.1	25.4	279.9

Source: CSO, Census of Industrial Production 1989.

Comparative data on the characteristics of the three key sectors of pharmaceuticals, office and D.P. and "other foods" confirm that Irish productivity levels in each of these sectors are dramatically above those of other EC countries (see Table 21). The biggest gap occurs in the case of the

Other Food" sector, where Irish productivity levels are over eight times the EC average, and almost seven times higher than the next-highest EC country³⁴. In all three sectors, the range of productivity levels between the other six EC countries shown is quite narrow,³⁵ with Ireland standing out as a clear outlier.

TABLE 22
**Productivity Levels in the Pharmaceuticals,
 Office and Data Processing and "Other Foods" Sectors 1988**
GVA per Employee ('000 ECU)

	Pharmaceuticals	Office & D.P.	"Other Food" ¹
Ireland	166.0	165.4	347.8
Belgium ²	56.5	39.0	39.5
Denmark	67.7	43.8	51.6
Germany	52.4	50.5	40.4
France	50.3	79.5	44.4
Italy	57.0	78.6	50.5
UK	63.4	70.4	40.4
EC-12	54.3	N.A.	42.5
Irl. as % EC avg.	305.7	N.A.	818.4
Irl. as % next highest	245.2	208.1	674.0

¹ "Other Food" category equals NACE 423.

² Data for Belgium relate to 1987.

Source: Eurostat, Structure and Activity of Industry, 1987/88.

Comparative data on sectoral productivity rates suggest strongly that transfer pricing is taking place in the Irish manufacturing sector. This phenomenon does not seem to be a significant issue in other western economies³⁶. It appears to be particularly pronounced in three sectors of Irish manufacturing industry: pharmaceuticals, office and data processing and the "Other Food"

³⁴ The composition of the 'Other Foods' category in Ireland, which is dominated by the production of cola concentrates, differs significantly from that of other European countries and thus limits somewhat the value of this sectoral comparison.

³⁵ The widest dispersion occurs in the Office and Data Processing sectors, where the productivity level of the highest country (France) is just twice that of the lowest (Belgium). Even here, the gap is probably exaggerated slightly by the fact that the Belgian data relate to 1987.

³⁶ Countries likely to experience transfer pricing on any significant scale are those which have, like Ireland, successfully pursued a policy of low corporate tax rates as a mechanism for attracting foreign direct investment.

category. These three sectors accounted for 33.2% of total manufacturing net output in 1989 and were responsible for 39.6% of the total growth in manufacturing net output between 1980 and 1989.³⁷ If the propensity to engage in transfer pricing has remained unchanged over the past two decades,³⁸ the very rapid growth of these sectors, which have relatively high rates of transfer pricing, will have increased the impact of such factors on the overall figures for manufacturing industry³⁹. Some of the apparent rise in productivity in Irish manufacturing is thus "illusory" in that it owes more to the accounting practices of multi-national corporations than to any fundamental change in the relationship between output growth and employment growth in Ireland.

How significant an effect does transfer pricing have on the overall figures for manufacturing output growth and productivity growth in Ireland? Would the profile of Irish manufacturing in the 1980s, as a sector of high output growth and exceptionally rapid productivity growth be significantly changed, if the effects of transfer pricing were excluded from the data? A crude estimate of the effects of transfer pricing on output growth and productivity growth in the manufacturing sector may be derived by adjusting the recorded data on manufacturing output growth to take account of outflows of profits, royalties and dividends. Information on these outflows is available for each year since 1984, and a sectoral breakdown provided by the CSO confirms that the vast majority of these outflows (over 90%) stem from the industrial sector. If it were assumed that all of the outflows of profits, dividends and royalties from the industrial sector represented payments (either real or "book transactions") for production carried on, or profits earned, *outside* Ireland, then the exclusion of these outflows from the manufacturing output data would produce a reasonable estimate of the "true" GDP arising in manufacturing in Ireland.⁴⁰ Clearly such an assumption would significantly *overstate* the extent of adjustment warranted: despite the

³⁷ Growth here has been measured in current prices.

³⁸ Opportunities to transfer price in Ireland may, in fact, have *diminished* in recent years with the narrowing of tax differentials between Ireland and many other countries (as Ireland has moved away from ESR and other countries have gradually been experiencing a downwards drift in corporate tax rates) and the toughening of attitudes by Revenue authorities in some major economies (particularly the US).

³⁹ This is due purely to a *compositional* effect and reflects the above-average growth rates of sectors with higher-than-average levels of transfer pricing.

⁴⁰ The approach adopted here reflects the belief that Ireland's industrial output figures overstate the real extent of industrial production carried out in Ireland. This is primarily because a substantial proportion of the recorded net output of overseas firms is thought to be illusory, in that it reflects transfer pricing policies. An additional factor contributing to the overstatement of the net output figures results from the inclusion in net output of production activities carried on *outside* the state. This would arise, for example, in the case of explicit or implicit remuneration of services such as R&D, marketing or distribution carried on overseas, by other units of the multi-national.

growing significance of sectors which display characteristics indicative of transfer pricing, it remains the case that over half (53%) of the net output of overseas industry in 1989 occurred in sectors which do not display any marked such tendencies⁴¹. Moreover, even in sectors where transfer pricing is believed to occur, a substantial proportion of the outflows from these sectors represent the repatriation of monies earned in respect of activities genuinely carried out in Ireland. Finally, at a more technical level, the level of sectoral disaggregation available to us does not allow outflows from the manufacturing sector to be isolated from those of the wider agriculture/industry sector. While manufacturing industry undoubtedly accounts for the vast majority of such outflows,⁴² treating all of them as manufacturing (as is done here) must again exaggerate the true extent of the adjustment required.

Table 23 shows the annual average growth rate of output, employment and productivity in the transportable goods sector for the period 1984 to 1990, under two different scenarios: scenario 1 presents the measured growth rates, as recorded in the official GDP figures for the transportable goods sector.⁴³ This provides an *upper estimate* of the rate of growth of output and productivity during this period. Scenario 2, represents a crude estimate of what output and productivity growth in the sector might have looked like in the absence of transfer pricing⁴⁴. It is derived by deducing 50% of the outflows of profits, dividends and royalties from the combined agricultural/industry sector in order to produce an "adjusted" measure of the rate of growth of GDP arising in the transportable goods sector⁴⁵. The gap between it and the growth rates recorded under scenario 1 provide a rough estimate of the degree to which Ireland's manufacturing output and productivity growth rates may be exaggerated by the effects of transfer pricing. The true rate of output and productivity growth is likely to lie somewhere within the band delimited by scenarios 1 and 2.

41 In some sectors, such as drink and tobacco, a significant proportion of profit repatriations result from profits arising as a result of sales on the *Irish* market. In such circumstances, it clearly does not make sense to deduct the profit outflows from the recorded output data.

42 Outflows of profits, dividends and royalties from the agricultural sector are very small and were included with the industrial total in the CSO's figures in order to preserve confidentiality.

43 The Transportable Goods sector includes manufacturing industry plus mining, quarrying and turf. The sectoral GDP data available to us do not allow us to isolate the manufacturing component.

44 "Transfer pricing" is used here to denote *all* factors contributing to the overstatement of Ireland's industrial output data. It includes the effects attributable to the inappropriate classification of some service imports by multi-national companies. (See Footnote 40).

45 The figure of 50% is not intended to be exact. We would consider it a reasonably cautious estimate which probably represents the *maximum* level of adjustment warranted. The true rate of output and productivity growth are likely to be within the band represented by scenarios 1 and 2.

The striking feature of Table 23 is that, even if we were to adopt the position represented by scenario 2 (whereby 50% of outflows of profits, dividends and royalties from the combined agricultural/ industrial sector are deducted), the rate of growth of output and productivity in Ireland's transportable goods sector in 1984-1990 would remain high relative to other OECD countries⁴⁶. While the figures in Table 23 must be treated with caution, they provide a useful indication of the *band* within which the underlying growth rate of manufacturing output and productivity is likely to occur. They confirm, on the one hand, that the growth of manufacturing output and productivity in Ireland may indeed be overstated by a not insignificant amount. (The reduction in the recorded output and productivity growth rates under scenario 2 amounts to 1.4 percentage points per annum over the period in question). At the same time, they help to keep that effect in perspective: even under the fairly rigorous assumptions outlined above, the basic features of Ireland's manufacturing sector remain unchanged. In particular, the rate of growth of manufacturing output and productivity in Ireland is shown to remain high relative to other countries, irrespective of the effects of transfer pricing.

TABLE 23
Annual Average Growth Rates of
Output, Employment and Productivity
in the Transportable Goods Sector, Ireland 1984-1990.
Effect of Adjusting for Outflows of Profits,
Dividends and Royalties.
% Changer per Annum 1984-1990

	Output	Employment	Output Per Employee
Scenario 1² (Upper Limit) Recorded data	7.6	0.7	6.9
Scenario 2² (Lower Limit) Deducting 50% of profits, etc. outflows	6.2	0.7	5.5

1 GDP arising in the Transportable Goods sector.

2 See text for full discussion of the two scenarios.

Source: Sectoral details of GDP and Profit Outflows supplied by CSO. Employment data from Labour Force Survey.

46 Table 39 in Section 6 below gives details of manufacturing output, employment and productivity growth in other OECD countries during the period 1984-1990.

(iii) The Extent of Intra-sectoral Productivity Growth

Trends in productivity growth within existing sectors of industry can provide some useful insights into the extent of change in output/employment relationships in manufacturing industry over the past two decades. Despite its significance at an aggregate level, transfer pricing is not a significant issue for the vast majority of sectors, so that in most cases the sectoral data on output and employment growth may be taken as accurate reflections of underlying productivity relationships.⁴⁷ This allows us to make meaningful comparisons of sectoral trends, both over time in Ireland, and relative to trends in other countries.

Appendix 2 gives annual average growth rates of output, employment and productivity for 17 sub-sectors of Irish manufacturing industry over the period 1973-1990, distinguishing between high-tech, medium-tech and low-tech industries. In Table 24 below, five sectors which are important in terms of their contribution to manufacturing employment are singled out, to illustrate some of the different patterns apparent in the more detailed Appendix table. These five sectors accounted for 50.2% of total manufacturing employment in 1989. One of the five (electrical engineering) falls within the high-tech manufacturing industry,⁴⁸ while the remaining four sectors comprise the core of low-tech industry in Ireland. All five have a strong indigenous component.

All five sectors shown in Table 24 have experienced a rise in labour productivity (and, hence, a fall in employment intensity) over the period 1973-1990. The extent of the rise has varied from an average of 0.9% per annum in the case of the paper and printing sector, to an average of 7.1% per annum in electrical engineering. Employment trends in each sector are determined, however, not by the trend in productivity per se, but by the relationship between output growth and productivity growth. Thus, the table provides ample evidence that high productivity growth is compatible with growth in employment, providing output growth is sufficiently strong (witness the performance of the electrical engineering sector). Equally, low productivity growth is not in itself a guarantee of employment growth, unless it is accompanied by adequate output growth (as is seen by the collapse of the clothing sector).

⁴⁷ The exceptions to this are identified in Section (ii) above: i.e. pharmaceuticals, office and data processing and other food.

⁴⁸ Relative to other sectors of high-tech industry, the electrical engineering sector is more long-established in Ireland and contains a not insignificant indigenous component. In 1989, 23% of employment in the sector and 7.3% of net output came from Irish-owned firms. Its behavioural patterns are not altogether typical of the high-tech sector, but are important because of its significance in employment terms.

TABLE 24

Annual Average Change in Output, Employment and Productivity; Major Sectors* of Manufacturing Industry; Ireland, 1973-1990

	% Change per Annum			
	1973-79	1979-86	1986-90	1973-90
Electrical Engineering				
- Output	+3.7	+12.1	+22.3	+11.3
- Employment	+3.6	+3.2	+6.6	+4.2
- Productivity	+0.1	+8.9	+15.7	+7.1
Food				
- Output	+5.1	+3.3	+5.9	+4.5
- Employment	+0.2	-3.1	-0.4	-1.3
- Productivity	+4.9	+6.4	+6.3	+5.8
Textiles				
- Output	+2.4	-3.4	+4.7	+0.5
- Employment	-2.5	-7.1	+0.5	-3.7
- Productivity	+4.9	+3.7	+4.2	+4.2
Clothing, Footwear + Leather				
- Output	-2.5	-3.3	-2.5	-2.8
- Employment	-3.0	-5.3	-3.5	-4.0
- Productivity	-0.5	+2.0	+1.0	+1.2
Paper & Printing				
- Output	+0.9	-0.1	+6.9	+1.9
- Employment	-0.1	-3.2	+1.5	-1.0
- Productivity	+1.0	+3.1	+5.4	+0.9

* The sectors selected each accounted for more than 5% of total manufacturing employment in 1989. For details of other sectors, see Appendix 2.

Electrical engineering provides an example of a very rapidly growing sector, capable of supporting strong growth in both employment and productivity. Despite the rapid acceleration in productivity growth rates in the sector during the 1980s, the rate of employment growth increased substantially to 6.6% per annum in 1986-1990, from an already high starting base.⁴⁹ The low-tech sectors, by contrast, are generally typified by much slower (or, in the case of the clothing sector, negative) output growth, and pronounced

cyclical effects. Thus, the recession of the early 1980s was accompanied by a significant slowdown in output growth in all four low-tech sectors shown, followed by a broadly based recovery in the second half of the decade. Productivity trends in the textile sector followed the expected pattern, with productivity growth declining as output growth slowed in 1979-1986 and rising again with the recovery in 1986-1990. The food and paper and printing sectors have shown a continuous rise in productivity growth rates throughout the period,⁵¹ while productivity growth in the clothing, footwear and leather sector has fluctuated within a narrow band of 0-2% per annum.

It is clear, therefore, that the pattern of productivity growth at sectoral level is more diverse than the continuous upward trend suggested by the aggregate data for manufacturing industry as a whole.

More detailed examination of the links between output growth and employment growth at individual establishment level has been carried out by Keating and Keane (1988/89) for the period 1979-1985. Their analysis produced some interesting results: first, it confirmed that the majority of firms which increased output over the period also increased employment, while the majority of job losses arising occurred in firms with declining output.⁵² Confirmation of these basic relationships was, in fact, non-trivial, given that the period was characterised by rising manufacturing output, falling employment and growing concern about "jobless" growth. Second, the study showed that a sizeable minority of firms (18.6%) which expanded output over the period 1979-85 actually reduced their workforce. In the case of these firms, the rise in output achieved was lower than in firms where rising output was accompanied by stable or growing employment. Finally, the results produced some interesting evidence about the incidence of "jobless growth", which showed that it was more pronounced among

49 Total employment in the sector was 20,185 in 1989, or 10.6% of total manufacturing employment.

50 The experience of electrical engineering in achieving a continuous rise in output growth rates over the three periods shown is not typical of the high-tech sector generally. In both the pharmaceutical and office and data processing sectors, output growth rates fell over the period. This partly reflected the "newness" of the sectors in the 1970s (so that relatively small increases in absolute terms could give rise to very large percentage increases in output) but also reflects a sensitivity to global business cycles.

51 In the case of the food sector, some of the rise in productivity in the 1980s will be due to transfer pricing in the "other food" sector (see Section (ii) above). It is clear, however, that substantial *real* gains in productivity in this sector have been made. The rise in productivity growth in the paper and printing sector was from a very low starting rate (1% per annum in 1973-1979).

52 The terms "expanding", "stable" and "declining" were used by Keating and Keane as follows:
"Expanding" implied a rise in output (or employment) of over 2% per annum on average during the period 1979-1985;
"Declining" signified an average fall in output (or employment) of over 2% per annum;
"Stable" signified output (or employment) remaining within a range of +/- 2% per annum.

Irish-owned industry, and in low-tech sectors of manufacturing than in the overseas dominated high-tech sectors. A sectoral breakdown of firms which increased their output during 1979-1985 showed that the phenomenon of "jobless growth" was particularly evident in the Food and Drink and Tobacco sectors. In Food, just under half of all establishments which increased output failed to increase employment, with 26% of the total (74 establishments) reducing their workforces despite rising output. The equivalent figures for the Drink and Tobacco sector were that nearly two-thirds of expanding firms (65.5%) failed to increase employment, with 34% of the total reducing their workforce. Productivity growth in these sectors has thus been characterised by labour shedding and rationalisation to a greater extent than in other sectors.

How do sectoral productivity trends in Ireland compare with those of other countries? The evidence suggests that, outside the high-tech sectors, long-run labour productivity growth rates in Irish manufacturing industry may not in fact differ dramatically from international norms.⁵³ Table 25 presents the results of a study of labour productivity growth rates in manufacturing industry in 7 major OECD economies for varying periods in the 1970s and 1980s (OECD, 1992a).⁵⁴ Separate estimates are provided for high-tech, medium-tech and low-tech manufacturing industry. A crude estimate of Ireland's labour productivity growth rate in each of these three categories for the period 1973-1990 is given in the final column for purposes of comparison.⁵⁵

The comparability of the data shown in Table 25 is obviously limited because of the very different time periods covered for the different countries and hence, the different phases of the business cycle reflected in the figures. Moreover, the extent of structural change in Irish manufacturing industry over the period means that the base year used to weight the individual sectoral estimates can have a significant bearing on the productivity growth rates shown for the different categories. Despite these caveats, the table provides a number of interesting insights: first, it is obvious that, outside the high-tech sectors, the rate of long-run labour productivity growth in manufacturing industry lies within a very narrow range of roughly 2-4% per annum in most countries examined. Second, and again excluding the high-tech sectors,

53 The sectoral data available for other countries do not allow for a completely satisfactory comparative analysis. Differences in the time periods available for different countries, and differences in the level of disaggregation provided, mean that many of the international comparisons have to be taken as indicative rather than fully conclusive. The broad conclusions arrived at should, however, prove robust.

54 The corresponding rates of output growth and employment growth by category for each country are presented in Appendix 3.

55 These estimates are derived from the sectoral data presented in Appendix 3, using the net output data for 1983 (roughly the mid-point of the series) to weight the various categories.

2 Data for the Food, Drink and Tobacco sector for Ireland in 1980 relate to GVA at market prices. This will overestimate productivity levels in Ireland relative to the EC, but was deemed preferable to using the estimates prepared by Eurostat. These imply a very dramatic adjustment to the data supplied by Ireland's CSO and suggest that productivity in the sector in 1980 (as measured by GVA per employee at factor cost) was only 5.6 thousand ECU, or 28% of the EC average. This is the only sector in which such a dramatic difference occurs.

3 No EC average for Office and D.P. is provided, but the figures for individual countries confirm that Irish productivity in this sector is substantially above average (see Section (ii) above).

Source: Eurostat, *Structure and Activity of Industry*, 1980/81 and 1987/88.

The final column of Table 26 expresses productivity levels in each sector of Irish manufacturing as a percentage of the EC-nine average. *The data do not support the view that labour productivity growth in Irish medium and low-tech industries has been uniformly higher than in other developed EC economies:* in seven of the fourteen sectors examined, the gap between Ireland and the EC has narrowed over the period, but in a further six sectors the gap has widened,⁵⁸ pointing to relatively slow rates of productivity growth in Ireland.

3.1 THE INDIRECT EFFECTS OF MANUFACTURING GROWTH ON SERVICES

Up to now, the focus in this section has been on examining the relationship between the growth of manufacturing output and the growth of employment directly within the manufacturing sector. The employment effects of manufacturing growth are not, however, confined to the manufacturing sector alone, but impact also on other areas of the economy, particularly in services. O'Malley (1992:11) outlines a range of indirect employment effects emanating from the manufacturing sector. These are classified under three headings: (i) *vertical effects*, which result from the backward and forward linkages of manufacturing firms. These are sometimes described as the "indirect" employment effects of manufacturing growth, and comprise the employment generated in producing *inputs* for manufacturing activity (backward linkages) or in the processing and distribution of manufacturing outputs (forward linkages); (ii) *macro-economic effects*: the effect most commonly included under this heading is the "induced" employment generated by the spending of incomes arising in the manufacturing sector. It also includes a number of other potential employment effects, resulting for example from the impact of manufacturing output growth on tax revenues,

58 The apparent fall in productivity in the Food, Drink and Tobacco sector relative to the EC average may be due to the *overestimation* of Ireland's relative productivity in 1980. The productivity estimates for this sector should be treated with extreme caution. See Note 2 beneath Table 26 for explanation.

capital markets, etc. These however are very rarely quantified. (iii) *horizontal effects*: these effects, which are very difficult to quantify, would include both "narrow" effects (eg. the employment effects on others competing for supplies of similar inputs or labour skills) and "broad" effects (eg. the impact on others via the influence of manufacturing industry on the development of infrastructure, technology, etc.). Efforts to evaluate the *overall* employment effect of manufacturing output in the economy must take these secondary employment effects into consideration.

Recent work by O'Malley (1992) represents the most comprehensive attempt to date to explore, and begin to quantify, some of the wider effects of manufacturing growth on the growth of employment in the economy. The work, which is ongoing, has focused initially on the "indirect" employment effects generated by the purchases of manufacturing industry. It uses detailed information on the expenditure patterns of industry (taken from the IDA's Irish Economy Expenditure Survey), in conjunction with input/output analysis, to provide detailed estimates of the employment associated with different levels of industrial purchases. The results obtained to date are preliminary and are subject to revision. They do, however, provide a useful indication of the broad trends likely to emerge, and are helpful in providing a rough quantification of the magnitude of indirect employment effects.

We focus here on one aspect of O'Malley's research, namely the indirect employment effects of services purchases made in Ireland by the manufacturing sector.⁵⁹ Table 27 is taken from O'Malley (p. 42) and presents his preliminary findings regarding the extent of indirect service employment supported by industry's purchasing of services. It suggests that, in 1983, every 10 direct jobs in manufacturing were associated with a further 5.6 jobs in Irish services, as a result of the purchases of services by manufacturing industry. By 1990, this ratio had risen slightly to 5.8.

The stability of the aggregate ratio of indirect services employment to direct manufacturing employment in 1983 to 1990 should not be taken as pointing to an *inherently* stable relationship, likely to persist in the future. In fact, O'Malley points out that the fact that the ratio showed little change over the period was somewhat of a freak occurrence, reflecting as it did a myriad of changes at sectoral level and important differences in the rates of growth among different sectors.

59 The term "Irish services" is used hereafter to refer to service activities purchased in Ireland by manufacturing firms.

**Direct Industrial Employment and Indirect Services Employment
Supported by Industry's Purchasing of Services (Thousands)**

	1983	1987	1990
Direct Industrial Employment			
Overseas	82.9	78.7	85.3
Indigenous	127.3	111.8	115.9
Total	210.2	190.5	201.2
Indirect Services Employment			
Overseas	50.5	54.1	59.4
Indigenous	67.8	52.5	56.9
Total	118.3	106.6	116.4
Direct Plus Indirect			
Overseas	133.4	132.8	144.7
Indigenous	195.1	164.3	172.8
Total	328.5	297.1	317.6
Ratios of Indirect to Direct ¹			
Overseas	6.1	6.9	7.0
Indigenous	5.3	4.7	4.9
Total	5.6	5.6	5.8

¹ Number of indirect services jobs for every 10 direct jobs in industry.

Source: O'Malley (1992) p.42.

The distinction drawn in Table 27 between indigenous and overseas industries points to divergent trends in these two categories. The indirect impact of indigenous industry on services employment *fell* during the period, with the ratio of direct to indirect jobs declining from 5.3 in 1983 to 4.9 in 1990. By contrast, the trend in overseas industry was for an *increasing* impact on services employment, with the ratio of indirect services jobs for every 10 manufacturing jobs rising from 6.1 in 1983 to 7.0 in 1990. The difference in trend is explained by O'Malley by reference to (a) the fact that sales per employee grew more rapidly in overseas firms than in indigenous industry, and (b) the *proportion* of sales spent on Irish services rose in overseas firms, while it did not increase in indigenous firms.

An important message emanating from O'Malley's work is that the trend in direct industrial employment is *not* a reliable indicator of the trend in the overall employment impact of industry in the economy. It is clear even at this early stage of his analysis that there is considerable scope for the relationship between the direct and indirect employment effects of manufacturing growth to change over time, as the sectoral composition of industry changes. This underlines the importance of continuing to pursue the lines of analysis currently being explored, so that the impact of manufacturing growth on the growth of total employment in the economy may be more fully understood.

4. THE PERFORMANCE OF THE SERVICES SECTOR

The previous section examined the relationship between output and employment in the *manufacturing* sector. It showed that productivity growth in manufacturing in Ireland was more rapid than in other countries during the 1980s and examined the reasons for this divergence.

The purpose of this section is to examine the performance of the *services* sector. Our interest stems from the fact that most jobs are now classified as being in the services sector. In 1992, almost 60% of employment in Ireland was in services. Most jobs in services are full-time jobs, but 80% of part-time jobs are located in services.

The outline of this section is as follows: Firstly we examine the *share of services* in employment and output in Ireland and other EC countries. Secondly, we will compare *trends* in employment and productivity in services over the past two decades at an aggregate level, highlighting the distinctions between the performance of the market and non-market service sectors. Finally, we will consider changes *within* individual sub-sectors of services in Ireland.

4.1 Share of Services in Total Output and Employment

There has been a steady increase in the share of services in total employment in Ireland, from 39% in 1961 to 59% in 1992 (see Table 28). We divide services into *market* and *non-market* services. This distinction is, to a large extent, the same as that between *private* and *public* services. The primary difference relates to the classification of commercial public enterprises, which are part of the public sector, but are classified as being in the *market* sector ("commercial") rather than the non-market sector (See Appendix 4 for further discussion). In 1990, 70% of services employment in Ireland fell into the category of market services, while 30% was classified under non-market services. In terms of *total* employment, market services accounted for 40% (446,500) of total employment, while non-market services accounted for 17% (192,500) of total employment.

While the services sector has increased its share of total employment over the past thirty years, the share of services in total output has in fact declined somewhat over the same period.⁶⁰ In 1990, market services accounted for 35% of total output, compared to 38% in 1980. This reflects the fact that

⁶⁰ This point applies to output expressed in constant price or "real" terms. A different picture would emerge if output were expressed in current price terms, as the price of services has risen faster than the price of manufacturing output.

manufacturing output grew at a faster rate than market services output during the 1980s.⁶¹ The share of non-market services in output has also shown a decline in recent years, from 18% of total output in 1986 to 14% in 1990. This reflects *both* the strong performance of the manufacturing sector *and* the contraction of non-market services output in this period. The latter is determined by trends in non-market service *employment*, because the conventions applied to measuring output growth in this sector assume zero productivity growth (see Appendix 4 for further discussion).

TABLE 28
Sectoral Employment and Output Shares, Ireland, 1961-1992

(i) Sectoral Employment Shares (Percentage of Total Employment)

	1961	1970	1980	1986	1990	1992
Agriculture	37	27	18	16	15	13
Industry	24	30	32	28	28	28
- Construction	(6)	(7)	(9)	(7)	(7)	(7)
Services	39	43	50	56	57	59
- Market Services	(29)	(31)	(33)	(37)	(40)	N.A.
- Non Market Services	(10)	(12)	(16)	(19)	(17)	N.A.

(ii) Sectoral Output Shares (Percentage of Total Output¹)

	1961	1970	1980	1986	1990
Agriculture	15	12	10	9	10
Industry	27	33	35	37	41
- Construction	(5)	(7)	(7)	(6)	(5)
Services	58	55	56	53	49
- Market Services	(38)	(37)	(38)	(36)	(35)
- Non Market Services	(20)	(18)	(18)	(17)	(14)

¹ Based on constant price output data (1985 prices).

Source: *Employment*: Calculated from Department of Finance Databank.

Output, 1961: Calculated from Department of Finance Databank.

Output, 1970-90: Calculated from sectoral GDP data supplied by CSO.

⁶¹ Insofar as the rate of growth of manufacturing output was overstated due to transfer pricing (see Section 3.2 (ii)), this decline in the share of services is also overstated.

The share of market services in total employment in Ireland lies in the middle of the range of the EC countries (see Table 29). Given Ireland's relatively low GNP per capita, a lower ranking might have been expected. Spain, however, has a similar proportion of employment engaged in market services.

The proportion of employment in non-market services in Ireland (17%) ranks as eight out of eleven EC countries. The shares of non-market services are in fact quite close for most countries, with France (25%) and Denmark (31%) being higher than the other countries. Ireland's share of employment in non-market services is similar to Spain (18%) and Portugal (18%). Although the share of non-market services in total employment does not appear particularly high in Ireland, its share of total output is the third highest in the EC, at 16.7% (see Table 29(ii)). This would suggest that the proportionate cost of producing non-market services in Ireland is higher than elsewhere.

TABLE 29

**Significance of Market and Non-market Services
as a Proportion of Total Employment and Output,
EC Countries, 1989**

(i) Shares of Market and Non-Market Services in Total Employment (%)

1989		
	Market Services	Non-Market Services
Belgium	47.7	22.2
Denmark	35.3	30.9
Germany	36.7	19.9
Spain	38.6	17.9
France	39.8	25.3
Ireland (1990)	39.7	17.1
Italy	42.2	18.2
Luxembourg	52.0	13.5
Netherlands	50.9	16.1
Portugal	28.2	17.6
UK	48.6	20.1

(ii) Shares of Market and Non-Market Services in Gross Value-Added at Current Market Prices (%)

1989		
	Market Services	Non-Market Services
Belgium	52.5	13.0
Denmark	146.1	22.2
Germany	45.9	13.2
Greece	138.9	17.0
Spain	47.3	12.4
France	49.8	16.4
Ireland (1988)	36.6	16.7
Italy	48.9	13.3
Luxembourg	49.3	12.8
Netherlands	50.8	12.0
Portugal	42.7	13.3
UK	49.7	15.1
EC (12)	48.2	14.3

¹ These data relate to gross value-added at factor cost, not at market prices.

Source: (i) Eurostat National Accounts 1984-1989, Volume 2C, Irish Data: Department of Finance databank.

(ii) As for (i), but Irish data also from Eurostat.

4.7 Employment Performance in the Services Sector

(i) Total Services

We have seen above how services have come to represent an increasingly large share of total employment in Ireland. How does the growth of services employment in Ireland compare to elsewhere?

Over the period 1973 to 1990, the average annual rate of growth of services employment in Ireland was 1.7% (see Table 30). This places Ireland as fourteenth out of the sixteen OECD countries for which we have data. The non-European OECD countries enjoyed considerably faster growth in services employment at this time, as witnessed by the performance of the United States (2.7% p.a.), Canada (2.9% p.a.), and Australia (2.9% p.a.). The same was true of the performance of some of the Scandinavian countries, e.g. Norway (2.5% p.a.) and Finland (2.3%

p.a.). Within the EC, Italy and Greece recorded the fastest growth in services employment, both at 2.6% per annum. The growth of services employment in Ireland during 1973-1990 fell far short of these levels and was below both the EC and OECD averages (2.0% p.a. and 2.4% p.a. respectively).

There was considerable variation in performance over this seventeen-year period. During the period 1973 to 1979, services employment in Ireland grew by 2.7% per annum. This ranks Ireland as sixth out of the sixteen countries examined, below only the United States, Canada, Italy, Norway and Sweden. By contrast, during the 1980s, the increase in services employment in Ireland was very low compared to other countries, at 1.2% per annum. This represented lower employment growth than in any of the other countries for which we have data.

Looking at the wider international trends evident in Table 30, it is notable that the average rate of growth of services employment *increased* in the EC during the 1980s (from 1.8% p.a. in 1973-79 to 2.1% p.a. in 1979-90). This contrasts with a *decline* in the rate of growth in services employment in the OECD generally, from 2.5% p.a. in 1973-79 to 2.3% p.a. in 1979-90. Ireland, which suffered a dramatic slowdown in the rate of growth of services employment in the 1980s, was a notable exception to the EC trend.⁶²

The marked contrast between the growth in services employment in Ireland in the 1970s and 1980s, and the resulting change in Ireland's position from being a country of relatively *fast* growth in services employment in the 1970s to having the *slowest* recorded growth in services employment in the 1980s, reflect very different underlying trends in the performance of the market and non-market service sectors over these decades. The divergent patterns of employment growth in these two areas of the services sector are set out below.

⁶² Italy, France and Belgium also experienced slower growth in total services employment in 1979-90 than in 1973-79. The *extent* of the slowdown in these countries was modest, however, compared to the dramatic slowdown in Ireland.

TABLE 30
Total Services Employment Average Annual
Rate of Employment Growth (%)

	1973-90	1973-1979	1979-1990
Australia	2.9	2.2	3.3
Canada	2.9	3.6	2.5
US	2.7	3.2	2.4
Italy	2.6	2.7	2.5
Greece	2.6	2.2	2.9
Norway	2.5	4.0	1.7
Finland	2.3	2.2	2.3
Japan	2.1	2.2	2.0
Sweden	2.0	2.9	1.5
Spain	2.0	0.9	2.6
Denmark (76-90)	2.0	N.A.	1.7
UK	1.8	1.4	2.0
France	1.8	2.1	1.6
Ireland	1.7	2.7	1.2
Germany	1.6	1.5	1.7
Belgium	1.5	1.9	1.3
Netherlands	N.A.	1.8	N.A.
EC	2.0	1.8	2.1
OECD	2.4	2.5	2.3

N.A.: Not available.

Source: OECD Historical Statistics, 1960-1990, Table 1.11. Irish data: Department of Finance databank and CSO, Labour Force Survey.

Note: Countries are ranked on the basis of employment performance, 1973-1990.

(ii) Market Services

Our data on market (and non-market) services are drawn from a number of sources: Irish data are from national sources. For other EC countries the data are from the Eurostat National Accounts, which unfortunately only go up to 1989. Other countries are based on the OECD National Accounts, for which data are available up to 1990.⁶³

⁶³ See Appendix 4 for a more complete description of data sources.

Over the period 1970 to 1990, employment in market services in Ireland grew by 1.6% per annum (see Table 31). This places Ireland in the middle of the range of EC countries for which data are available. The most rapid growth in market services employment within the EC was achieved in Italy (2.8% p.a.). Italy's performance was, however, quite exceptional by EC standards, and all other EC countries fell into the range of 0.8% p.a. - 1.8% p.a. Ireland's growth in market service employment lies towards the upper end of this EC range. Market services employment growth was significantly stronger in *non-European* OECD countries than in the EC, as witnessed by the performance of Canada (3.3% p.a.), the United States (3.1% p.a.) and Australia (3.0% p.a.).

The pattern of employment growth in market services in Ireland over the past two decades has been less volatile than that of total services. While there was a recession-induced slow-down during the first part of the 1980s, the growth in market services employment was, on average, broadly similar during the 1970s and 1980s (1.5% p.a. in 1980-90 compared with 1.7% p.a. in 1970-80). We saw earlier that the growth in employment in *total* services was lower in Ireland than in any other country examined during the 1980s. This was *not* the case for *market* services. During the 1980s the growth of market services employment in Ireland (at 1.5% p.a.) compared quite favourably to other EC countries, although it remained below the rapid growth rates achieved in non-European countries, such as Australia (3.2% p.a.) and the US (3.0% p.a.).

TABLE 31

Employment in Market Services Average Annual Rate of Employment Growth (%)

(a) EC Countries

	1970-89	1970-80	1980-89	1985-89
Italy	2.8	2.6	3.0	1.8
UK	1.8	1.2	2.5	3.1
France	1.7	2.0	1.4	2.3
Ireland¹	1.6	1.7	1.5	2.9
Belgium	1.4	1.3	1.4	2.6
Netherlands	1.3	1.6	1.0	2.3
Germany	1.0	0.9	1.1	2.2
Denmark	0.8	0.6	1.1	1.4
Spain	N.A	N.A	1.2	4.8
Portugal	N.A	N.A	1.4	N.A

(b) Non-EC Countries

	1970-90	1970-79	1979-90
Canada ³	3.3	4.0	2.7
USA ²	3.1	3.3	3.0
Australia	3.0	2.8	3.2
Japan	2.4	2.4	2.3
Norway	1.8	2.4	1.3
Finland	1.2	0.9	1.5
Sweden ³	1.1	0.7	1.4

¹ Data for Ireland cover the period to 1990. The sub-periods used for Ireland are: 1970-90; 1970-80; 1980-90 and 1987-90. For explanation as to why the last of these periods was used, see text.

² US: 1970-1987 and 1979-1987.

³ Canada and Sweden: 1970-1989 and 1979-1989.

Source: (i) Italy, Greece, Spain, Portugal, France, UK, Belgium, Netherlands, Germany, Denmark: Eurostat National Accounts, 1984-1989, Vol. 2C, Tables 5 & 6, p.34. Irish data: Department of Finance Databank.

(ii) Other countries: calculated by aggregating the relevant sectors from OECD International Sectoral Databank and OECD National Accounts, Vol. 2 (see Appendix 4 for details).

Note: (a) Because of the different sources used, direct comparisons between EC and non-EC countries must be treated with caution.

(b) Countries have been ranked on the basis of the growth in market services employment 1970-1989/90.

The final column of Table 31 allows us to compare the growth of market services employment in EC countries during the recovery period of the second half of the 1980s. Employment in market services grew by an average of 2.9% per annum in Ireland during 1987-1990. This represented a considerably stronger performance than in earlier periods, and compares favourably with the growth rates achieved by other EC countries during *their* period of rapid employment growth (i.e. 1985-89).⁶⁴

Since employment in total services has shown more fluctuation than employment in market services, this implies that there have been very considerable changes in the rate of growth of non-market services employment which we will now consider.

⁶⁴ The final column of Table 31 compares Ireland's performance in 1987-90 with that of other EC countries in 1985-89. This is to allow for differences in the timing of the economic recovery (see Section 2.3 for more detailed discussion).

(iii) Non-Market Services

How does the growth in non-market services employment in Ireland compare to other countries? Over the period 1970 to 1990 employment in non-market services in Ireland grew by an average of 2.1% p.a. (see Table 32). This lies towards the upper end of the EC range. Within the EC, the highest rates of growth of non-market services were experienced by Spain (6.9% p.a.) and Denmark (3.4% p.a.). Outside the EC, relatively high rates of growth in "Government Service" employment were recorded in the Scandinavian economies, while the growth of "Government Service" employment in the US and Japan (but not Australia) was low by European standards.⁶⁵

All countries experienced a slow-down in the rate of growth of non-market service employment during the 1980s, except the US which maintained a constant (low) growth rate of 1.1% p.a.⁶⁶ The extent of the slowdown was significantly more marked in Ireland than in other countries, however, and became increasingly pronounced as the decade progressed. Ireland went from having the *third highest* growth rate of non-market services employment in the EC during the 1970s (at 4.2% p.a.), to having the *lowest* growth rate in the EC in the 1980s (at 0.2% p.a.). This dramatic turnaround reflects the fiscal policy swings of the past two decades, which gave rise to a sharp initial acceleration in the growth of public sector employment in the 1970s, followed in the 1980s by the stabilisation and eventual contraction of public sector numbers, as the necessary process of fiscal correction began to take effect. During the second half of the 1980s, employment in Ireland's non-market service sector fell sharply, by an average of 1.0% p.a. Ireland was the only country to register a *decline* in non-market service employment at this time. The pattern in most EC countries during these years was for modest growth in non-market service employment, of the order of 1 - 1.5% p.a.

65 Employment in "Government Services" is used here as a proxy for non-market services. See Appendix 4 for differences between the two concepts.

66 Curiously, the US data show an *increase* in this growth rate in the second half of the 1980s, to 1.8% p.a. in 1985-90. This contrasts markedly with the international trends and leaves the US with a relatively *high* rate of growth for this period.

TABLE 32
Non-market Services Average Annual
Growth Rates of Employment (%)

(i) EC Countries

	1970-89	1970-80	1980-89	1985-89
Spain	6.9	8.4	5.2	4.8
Denmark	3.4	5.4	1.2	0.9
Italy	2.2	2.7	1.6	1.1
Ireland ¹	2.1	4.2	0.2	-1.0
Germany	2.0	2.6	1.4	1.5
France	1.9	2.1	1.7	1.0
Belgium	1.4	2.4	0.3	0.0
Netherlands	1.1	1.7	0.4	0.2
UK	1.1	1.6	0.5	1.8
Portugal	N.A	N.A	1.8	1.6

(ii) Non-EC Countries³

	1970-90	1970-79	1979-90	1985-90
Norway	3.7	5.3	2.5	2.1
Finland	3.5	4.7	2.5	1.9
Sweden	2.9	5.0	1.3	0.3
Australia	2.9	3.3	2.6	1.9
US ²	1.1	1.1	1.1	1.8
Japan	1.1	2.3	0.2	0.0

¹ Irish data cover the period 1970-1990. The relevant sub-periods for Ireland are: 1970-90; 1970-80; 1980-90 and 1985-90.

² US data cover the period to 1989. The sub-periods are: 1970-79; 1979-89 and 1985-89.

³ Non-EC data relate to employment in "Government Services". See Appendix 4 for differences between this and the somewhat wider concept of "Non-Market Services" used for the EC.

Source: (i) Eurostat National Accounts, Vol. 2C, 1984-1989. Irish data: Department of Finance databank.

(ii) OECD International Sectoral Databank and OECD National Accounts. See Appendix 4 for details of the definition used.

Note: Countries are ranked on the basis of the increase in employment, 1970-1989/90.

When considering trends in output and productivity in services, it must be borne in mind that there are difficulties associated with the measurement of service outputs. In non-market services, problems arise in trying to measure output, both in value terms and in volume terms. The procedure generally used is to *infer* outputs from the level of inputs used (eg. by looking at the number of employees). In market services, it is possible to measure output in value terms, but there are still difficulties associated with the derivation of a volume (or constant price) measure of output. Smith (1989) devised a set of measures of service outputs for the UK, which provided different results for the growth of output of many service sectors than those derived using conventional measures and procedures. There was little effect on the *overall* rate of growth of services output, as discrepancies which emerged between Smith's measures and official measures for individual service industries tended to offset each other. His results, however, do point to the need for caution when studying output and productivity trends in services.

Productivity growth in services is generally considerably *lower* than that experienced in manufacturing. For example, productivity growth in services in Ireland over the period 1973 to 1990 averaged 1.1% p.a., in contrast to annual productivity growth of 5.9% p.a. in transportable goods. Even allowing for the fact that measurement difficulties may lead to the underestimation of productivity growth in services, while productivity in the manufacturing sector may be somewhat exaggerated (see Section 3.2 (ii)), it remains true that the services sector is characterised by slower productivity growth than manufacturing.

The differential between productivity growth rates in the manufacturing and service sectors means that changes in the *composition* of economic growth can significantly alter the overall employment-intensity of growth in an economy. Countries in which the share of services in economic growth is rising, will tend to experience an *increase* in the employment-intensity of growth. This is because, other things being equal, the average growth rate of labour productivity in the economy will have fallen. Conversely, countries such as Ireland, where the share of services in total economic growth has *fallen* in recent years, will tend to experience a *decline* in the overall employment-intensity of growth. The significance of this factor in contributing towards the relatively low employment-intensity of Irish economic growth during the recovery period of the late 1980s will be discussed later, in Section 6.

Table 33 shows average productivity growth in the services sector for 1973-1990, and for two sub-periods: 1973-79 and 1979-90. On average, over

the full period 1973-90, productivity growth in services in Ireland was equal to the EC average of 1.1% p.a. A few countries stand out as having had exceptionally *low* productivity growth in services in this period: notably the United States (0.2% p.a. for 1973 to 1987) and the North European economies of Denmark (0.2% p.a.), Sweden (0.2% p.a.) and, in particular, Norway (-1.0% p.a.). Japan, by contrast, has had unusually *high* productivity growth in services (1.9% p.a.). Other countries, including Ireland, lie within a relatively narrow range of 1/2 - 1% p.a.

The 1980s saw a general slow-down in productivity growth in the services sector. This slow-down was particularly pronounced in the EC, where productivity growth rates fell from an average of 1.7% p.a. in 1973-79 to 0.7% p.a. in 1979-90. Productivity growth in the OECD also slowed, but to a lesser degree. The effect of this was to wipe out the gap between the EC and the OECD which had existed prior to the 1980s, bringing EC rates of service productivity growth into line with the (lower) rates pertaining in the OECD.

In Ireland, productivity growth in services eased somewhat in the 1980s, in keeping with the international trend. The *extent* of the productivity slowdown in Ireland was considerably less, however, than in most other countries, with average productivity growth of 1.0% p.a. in 1979-90 compared with 1.3% p.a. in 1973-79. As a result, Ireland's relative position changed, from being *below* the average EC rate of productivity growth in the 1970s to being *above* the EC average in the 1980s.

Changes in the rate of productivity growth in the services sector are determined by productivity trends within market services, and by changes in the share of total services accounted for by the market and non-market sectors.⁶⁷ Table 34 shows average productivity growth rates in the market services sector during 1970-89/90 and for selected sub-periods. Productivity growth in market services in Ireland averaged 2.0% p.a. over the period 1979-90. This places it at the upper end of the EC range (after France with 2.3% p.a. and Germany with 2.8% p.a.), and is also somewhat higher than most non-EC countries. The US and Australia stand out as having exceptionally low rates of productivity growth in the market services sector (both with 0.5% p.a. in 1970-90) - a factor which is reflected in the low overall rate of service productivity growth in those countries.

⁶⁷ The conventions used for measuring non-market service output typically assume zero (or very low) rates of productivity growth. This means that the primary conduit through which non-market services affect overall productivity trends in the service sector is by changes in their share of total service output. Other things being equal, an increase in the share of non-market services will pull down average productivity growth rates in the services sector, and vice versa in the case of a fall in share.

TABLE 33

Productivity Growth in the Services Sector
Total Services Average Annual Change in Real Value Added
per Person Employed (%)

	1973-90	1973-79	1979-90
Japan	1.9	2.3	1.7
Canada	1.4	2.5	0.8
Spain	1.4	2.4	0.8
France	1.4	1.5	1.4
Germany	1.3	1.7	1.1
Ireland	1.1	1.3	1.0
Finland	1.0	0.6	1.6
Italy	0.8	1.4	0.4
Belgium	0.8	0.5	1.0
Greece	0.4	2.3	-0.7
Sweden	0.2	-0.3	0.4
Denmark	0.2	N.A	-0.1
US (1973-87)	0.2	-0.1	N.A
Norway	-1.0	-0.7	-1.1
Netherlands	N.A	2.0	N.A
UK	N.A	1.3	N.A
Australia	N.A	0.9	N.A
EC	1.1	1.7	0.7
OECD	0.8	1.0	0.7

Source: OECD Historical Statistics 1960-1990, Table 3.11. Irish data as for Table 30.

Note: Countries are ranked on the basis of the growth in service productivity, 1973-1990.

Nearly all countries experienced a slowdown in the growth of productivity in the market services sector during the 1980s.⁶⁸ The slowdown was particularly pronounced in the EC, and, within the EC, Ireland was one of the countries which experienced the *largest* drop in growth rates (from 2.9% p.a. in 1970-80 to 1.1% p.a. in 1980-90). One factor contributing towards the productivity slowdown at this time was the worldwide recession of the early

68 The UK is a notable exception to this trend, with productivity growth in market services rising from a very low level of 0.3% p.a. in 1970-80 to a relatively high rate of 2.1% p.a. in 1980-89.

1980s. The fact that this recession was particularly pronounced in Ireland (see Section 2.3) may help to account for the relatively large decline in Irish productivity growth rates in the market services sector at this time. By the second half of the 1980s, productivity growth in most of the larger EC countries had increased once more, and in many cases (including, significantly, Ireland) had moved back close to the levels obtaining in the 1970s.⁶⁹

The fact that productivity growth in the market services sector was slower in the 1980s than it had been the previous decade, and the fact that this slowdown was more marked in the EC than in non-EC countries helps to explain the trends in total service productivity growth which were seen in Table 33. However, given the fact that the behaviour of Ireland's *market service sector* provides a particularly marked example of the general EC trend, productivity growth in the *total services sector* might have been expected to fall in Ireland by *more than* the EC average. Instead, as we have seen, it fell by less.

TABLE 34

Productivity Growth in Market Services
Market Services Average Annual Change in
Output per Employee (%)

(i) EC Countries

	1970-89	1970-80	1980-89	1985-89
Germany	2.8	3.2	2.3	2.4
France	2.3	2.5	1.9	2.3
Ireland ¹	2.0	2.9	1.1	2.5
UK	1.7	1.3	2.1	3.0
Denmark	1.7	1.6	1.7	1.1
Netherlands	1.7	2.4	1.1	0.3
Belgium	1.5	2.3	0.9	0.8
Italy	1.0	1.9	0.2	1.8
Spain	N.A	N.A	1.7	-0.4
Portugal	N.A	N.A	1.4	N.A

69 Consider, for example, France, Italy and the UK. In Germany, productivity growth in the market services sector moved up slightly in the second half of the 1980s, after a substantial drop in the early years of the decade. Productivity growth in German market services in 1985-89 remained low, however, relative to the 1970s (2.4% p.a. versus 3.2% p.a.).

(ii) Non-EC Countries

	1970-90	1970-79	1979-90
Finland	3.1	3.0	3.2
Japan	2.5	2.7	2.5
Sweden ²	1.7	2.0	1.4
Canada ²	1.6	1.7	1.4
Norway	1.3	1.8	0.9
US ³	0.5	0.7	0.1
Australia	0.5	0.8	0.3

¹ Data for Ireland relate to 1970-90; 1970-80; 1980-90 and 1987-90. For explanation as to why the last of these periods was selected, see text.

² Canada and Sweden: 1970-1989 and 1979-1989.

³ US: 1970-1987 and 1979-1987.

Source: As per Table 31.

Note: Countries are ranked on the basis of productivity growth 1970-1989/90.

The relatively small fall in total service productivity growth in Ireland during the 1980s is accounted for by the substantial drop in the share of service output emanating from the *non-market* service sector. The decline in the share of non-market services put upwards pressure on productivity growth rates for the services sector as a whole, and offset a substantial part of the downward pressure from falling productivity growth rates in the market services sector. While similar countervailing forces were at work in several other countries at this time, their effect was particularly pronounced in Ireland because the decline in the share of non-market services was significantly larger than elsewhere.

4.4 Productivity Changes within the Market Services Sector in Ireland

Further insights into productivity trends within the market services sector in Ireland may be obtained by examining the patterns visible for individual elements of that sector. Data are available for four sub-sectors of the market services sector, and these are discussed briefly below:

Distribution: This is the largest sub-sector of market services, accounting for 38% of market services employment in 1990. Employment has shown a steady, though modest increase, with declines in the late 1960s/ early 1970s reflecting the supermarket revolution and a recession-induced decline in the 1980s. Productivity grew by an average of 2.7% p.a. over the period 1961 to 1990. There was rapid productivity growth of 8.3% p.a. in the last two years of our data set (1988-90), although this probably reflects a large element of "catch-up" after the substantial falls in productivity during the early 1980s (see Figure 2A).

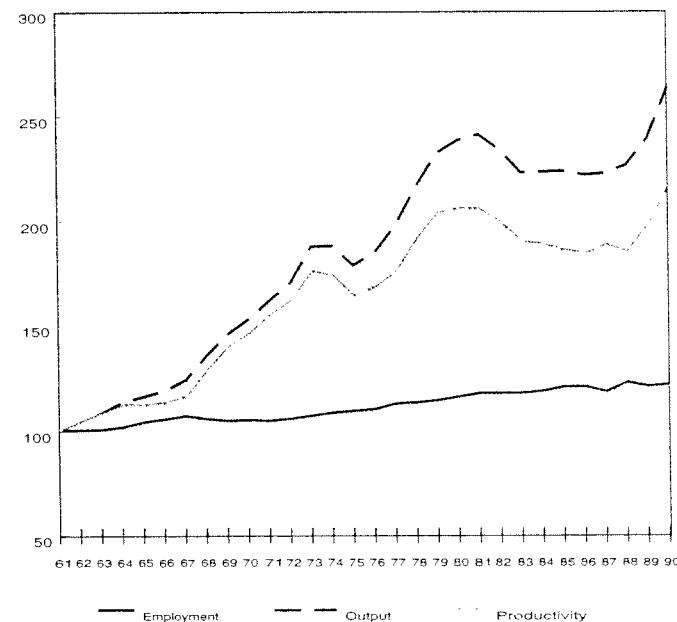
FIGURE 2A

Market Services: Trends in Output, Employment and Productivity

1961-1990

(i) Distribution

Index: 1961 = 100

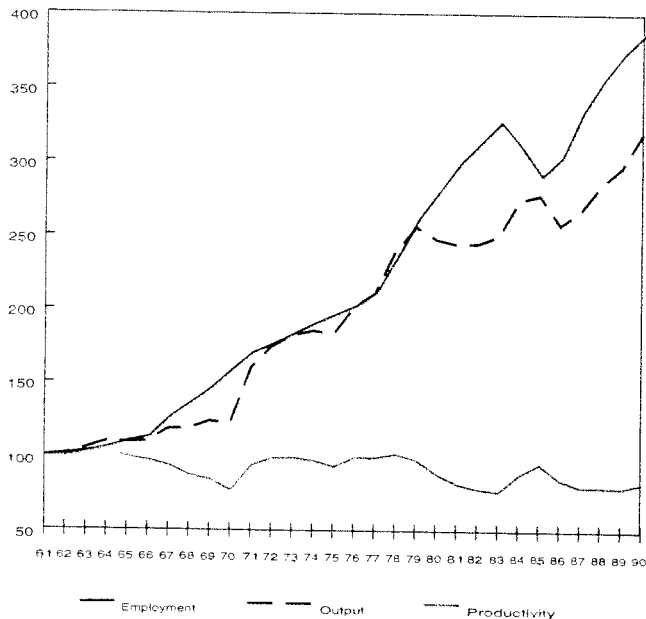


Source: Department of Finance Databank.

... services account for 12% of market services employment. This sector has had consistent output and employment growth throughout the past three decades, with particularly rapid growth in the late '70s, early '80s, and again in the second half of the '80s. The conventions used to measure output in this sector (see Appendix 4) mean that zero (or negative) productivity growth is recorded (see Figure 2B).

FIGURE 2B
Market Services: Trends in Output, Employment and Productivity

1961-1990
(ii) Insurance, Finance & Business Services
Index 1961 = 100

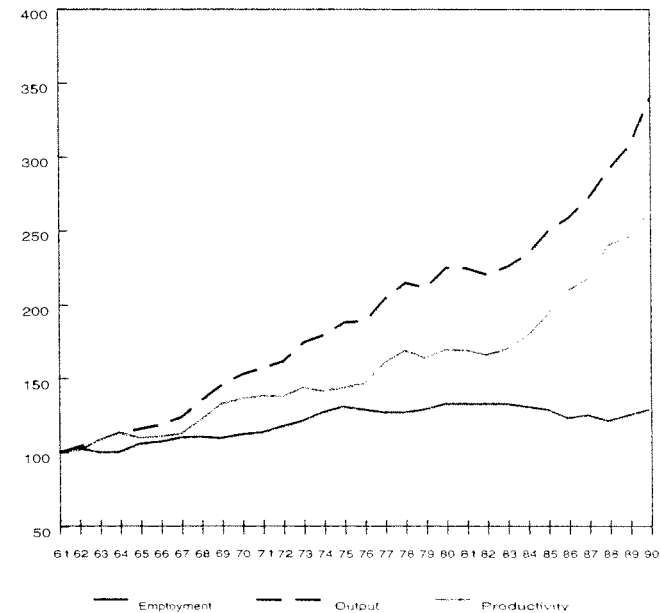


Source: See Figure 2A

Transport & Communications. This sector accounts for 15% of market services employment. It consists largely of state-sponsored bodies such as CIE, An Post, Aer Lingus and Telecom. It is the one area of market services which has experienced "growth without jobs". From the early 1980s there was rapid output and productivity growth, while employment declined. There was a recovery in employment in 1988-90, although in 1991 (not shown), employment again declined (see Figure 2C).

FIGURE 2C
Market Services: Trends in Output, Employment and Productivity

1961-1990
(iii) Transport & Communications
Index: 1961 = 100



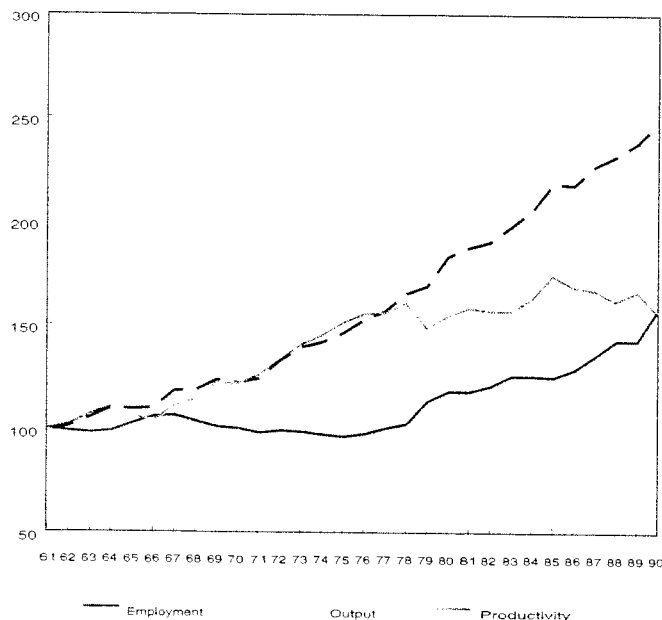
Source: See Figure 2A.

Professional and Personal: This is a residual category accounting for 34% of market services employment. The pattern of output and employment growth has been unusual. From 1960 up to the end of the 1970s, there was almost no employment growth while output and productivity grew together. From the end of the 1970s employment grew strongly, while output

productivity growth. This trend may be influenced by the growth in part-time employment in this category of market services (see Figure 2D).

**Market Services: Trends in Output, Employment and Productivity
1961-1990**

**(iv) Professional and Personal
Index: 1961 = 100**



Source: See Figure 2A

The rate of growth of services employment fell significantly in Ireland during the 1980s, from an average of 2.7% p.a. in 1973-79 to 1.2% p.a. in 1979-90. During the same period, the average rate of growth of services employment in the EC rose from 1.8% p.a. to 2.1% p.a. Ireland thus went from being a country of relatively *fast* growth in services employment in the 1970s, to being a country of exceptionally *slow* growth in services employment in the 1980s.

The principal factor accounting for the change in Ireland's performance relative to other EC countries over the past two decades has been the exceptional pattern of employment change in Ireland's *non-market services sector*. During the period 1970-80, employment in non-market services in Ireland grew by an average of 4.2% p.a., supported by expansionary fiscal policies. This was considerably in excess of the growth rates experienced in most other EC countries at this time, and helped to push the rate of growth in total service employment up above the EC average. This rapid growth had its counterpart in the 1980s, however, when the necessary process of fiscal correction prompted a sharp slowdown, and eventual contraction, in the growth of non-market service employment. Consequently while all EC countries experienced a slowdown in the growth of non-market service employment in the 1980s, the *severity* of the slowdown was significantly more marked in Ireland than elsewhere, and its effect in slowing the growth of total service employment was considerably more pronounced.

An indication of how the turnaround in non-market service employment growth has influenced the growth of *total* service employment in Ireland over the past two decades is given by the changing share of total service employment growth accounted for by the market and non-market sectors: in the 1970s, over half of the growth of total service employment in Ireland (52%) was accounted for by growth in non-market service employment. In the 1980s, this proportion fell to just 5%, and non-market services made a *negative* contribution to the growth of services employment during the latter half of that decade. This dramatic reduction in the contribution of non-market service employment constitutes the single most important factor accounting for the exceptional slowdown in service employment growth in Ireland in the 1980s.

In contrast to the non-market services sector, the performance of *market services* in Ireland has conformed very closely to EC norms over the past two decades. Employment growth in market services has been in line with that of most other EC countries, although slower than in many non-EC countries. Similarly, productivity trends in the market services sector have reflected closely the broader EC and international trends, with a marked slowdown in productivity growth in market services during the early 1980s, followed by a significant bounce-back during the recovery of the latter half of the decade. The productivity slowdown in market services during the 1980s did not reduce total services productivity growth in Ireland to the same extent as in other countries. This is because the unusually large decline in the share of *total* services output coming from the non-market service sector in Ireland acted as a countervailing influence, forcing up the underlying rate of service productivity growth.

5. DIFFERENT EXPERIENCES OF EMPLOYMENT GROWTH: THE RECORD OF EUROPE AND THE US

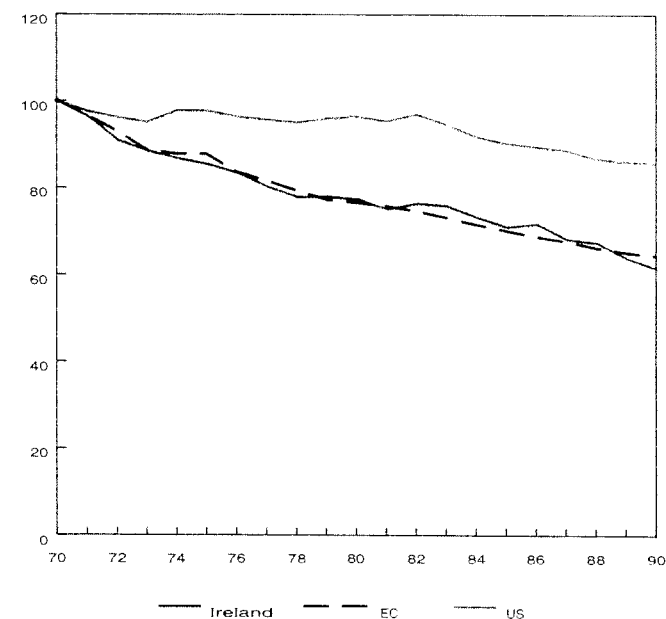
A consistent theme running throughout this report has been the marked differences in the employment growth records of Europe and the US over the past thirty years. The average rate of employment growth in the EC during 1960-1990 was shown to be just 0.4% per annum compared to an average of 1.9% per annum for the US. This is despite the fact that economic growth rates in the EC were slightly *higher* than the US during this period (3.4% p.a. and 3.2% p.a. respectively). Ireland has been shown to conform fairly closely to the 'European' norm, although significantly it has failed to participate in the move towards greater employment-intensity evident in Europe since the mid-1980s. This section takes a brief look at the US and European "models" of employment growth, and then moves on to consider some of the factors which may have contributed to a change in the European model in recent years.

5.1 US and European Models of Employment Growth

The record of the United States in achieving sustained growth in employment has attracted a great deal of attention from economists. Attention has focused on seeking an explanation for the United States' "employment miracle", of an annual average increase in the numbers at work of 1.9% between 1960 and 1990, compared to only 0.4% p.a. in the EC.

The stronger employment performance of the United States cannot be explained by stronger output growth. In fact output growth in Europe has been somewhat faster than in the United States. The explanation lies in significant differences in the rate of change in the labour intensity of production. Figure 3 charts the rate of decline in the labour intensity of production for Ireland, the EC and the US over the period 1970-1990. It shows that there has been very little decline in the labour intensity of production in the United States. The European experience has been of much more rapid reductions in the labour-intensity of production (faster growth in labour productivity). Ireland has followed broadly the European experience.

FIGURE 3
Labour Intensity of Production¹ Ireland, EC
and the US, 1970-1990
(Index 1970=100)



¹ Number of units of labour employed per unit of output.

Source: OECD Economic Outlook, No. 50 and 51.

The impressive employment performance of the North American and Australian economies is reflected in the extent to which they provided employment opportunities for a growing labour force. The supply of labour in the US grew by an average of 1.9% per annum between 1960 and 1990, while the EC labour force increased by only 0.6% per annum over the same period (see Table 35). In the United States this rapid labour force growth reflected an increase in the total labour force participation rate,⁷⁰ from 66% in the 1960s to 74% in the 1980s. By contrast, the EC participation rate showed a small decline - from 67% to 65.7% - over the same period.

Ireland, despite its high rate of natural increase in population (and therefore *potentially* high rate of labour force growth) had *actual* labour force growth of less than the EC average over the past 30 years. This reflects the impact of emigration.

⁷⁰ Total labour force as a percentage of the population aged 15 to 64 years.

**Average Annual Growth Rates of Labour Force and Employment
OECD Countries, 1960-1990**

* % Per Annum

	Labour Force	Employment
United States	1.9	1.9
Canada	1.2	2.4
Australia	2.4	2.2
Japan	1.1	1.1
Germany	0.4	0.3
France	0.7	0.4
Italy	0.3	0.1
Belgium	0.5	0.3
Finland	0.6	0.5
Iceland	2.1	2.1
Sweden	0.7	0.8
Ireland	0.5	0.26
Peripheral European:		
Greece	0.3	0.3
Spain	0.8	0.3
EC	0.6	0.4
OECD	1.2	1.1

Source: OECD (1992), Historical Statistics, 1960-1990. Irish data from Department of Finance Databank.

It follows that relatively high rates of labour force growth need not necessarily result in high rates of unemployment: the long-run performance of the US economy demonstrates that it is possible for employment growth to keep pace with population growth, while at the same time absorbing increases in labour force participation rates.

One of the most comprehensive attempts to identify the causes of the differences between the US and European employment experiences was the research carried out under the European Unemployment Programme. This Programme involved a study of the countries concerned using a common macroeconomic framework (unfortunately Ireland was not included). The empirical findings from this study suggest an explanation of the contrast between the United States "employment miracle" and Europe's persistent unemployment in terms of two proximate causes: (i) the wage formation

process differs as between the two zones, in particular regarding the incorporation of measured productivity gains into real wages; (ii) the openness of the European countries grew markedly in the late 1970s and mostly remained high. The same was not true of the United States (Dreze and Bean, 1989).

In Europe, real wages incorporate productivity gains quite rapidly, with short run elasticities of wages with respect to productivity ranging from 0.4 to 0.8 and long-run elasticities close to 1. By contrast, measured productivity does not enter significantly into the US wage equation.

One way of illustrating these differences between the United States and Europe is to consider the composition of changes in the wage bill. If we compare the total wage bill for an economy at two points of time we can decompose changes in the total wage bill as follows: (i) changes due to an increase in the number of employees; (ii) changes due to paying higher wages to the original number of employees; and (iii) a residual term reflecting the cost of paying the extra employees the final average wage, rather than the original wage.

The results from the calculations for a number of countries are presented in Appendix 5 (omitting the residual term). It is clear that, in the United States, most of the increase in the wage bill has on average over the past twenty years been allocated to increasing the number of employees. By contrast in European countries, most of the increase has been used to increase the average level of compensation per employee. Ireland follows this European trend.

A consequence of the differences in wage formation processes and outcomes is a difference in trends in real earnings. Over the period 1960 to 1990 average real wages grew by 45% in the United States, compared to 151% in the EC. In Ireland, over the same period, average real wages grew by 175% (Leddin & Walsh, 1992, p.264). The evolution of incomes has been such that income per worker in Ireland has increased relative to the EC average from 69% in 1973 to 80% in 1990. However, GNP per head of population has shown much lower rates of relative increase from 59% of the EC average in 1973 to 62% in 1990. This reflects the fact that the proportion of the population at work in Ireland, at 31%, has been falling and is the lowest in the EC. By contrast, employment rates in both the EC and the OECD have been rising.

The American wage bargaining process which produces this high employment outcome is characterised by highly decentralised wage negotiations. It does not follow, however, that decentralised bargaining is

either a necessary or sufficient condition for efficient wage bargaining, defined as securing low levels of unemployment. Research evidence suggests that *extremes* in wage bargaining are most successful in producing market clearing outcomes. That is, either highly decentralised (e.g. the United States) or centralised (e.g. Sweden) wage negotiations appear to be most successful. Intermediate level outcomes, where there is some degree of centralisation so that wages are not subject to the discipline of the market, but not enough centralisation to ensure that the macroeconomic consequences of wage bargaining are given sufficient weighting, appear to produce the least efficient outcomes.

Experience in the United States and Australia provides a comparison of centralised and decentralised bargaining. In the most recent period of economic expansion, Australia pursued centralised wage bargaining and employment intensive growth was achieved. A similar outcome was achieved in the United States using decentralised bargaining.

Implications of the American Experience

We have seen that the US has achieved much stronger employment growth than Europe over the past thirty years, even though output growth was not faster in the US than Europe. Is it possible for Europe in general and Ireland in particular to achieve such a pattern of output and employment growth?

Although the US employment record is positive, the US pattern of development over the past two decades is not without its critics. Firstly, the other side of a slow fall in the labour intensity of production is slow productivity growth. A succinct statement of this criticism of American growth is given by Porter (1990):

"Wage growth has been slower in the United States than in the majority of the other advanced nations, reducing pressure to improve productivity. A large pool of available labour entered the American labour force in the 1970s and 1980s, a function of the post-war baby boom, more women working and immigration. With many new employees available, American firms did not face the same pressure to automate and move into more sophisticated segments as did those in most other advanced nations. The necessity was lacking for firms to invest in improving the skills of the employees they had, because a ready supply of new employees was available. While many new jobs were created, the rate of upgrading of the American economy was set back. At the same time, economic growth could occur despite sluggish growth in productivity".

Reduced pressure to automate, resulting from an increase in labour supply and an associated decline in real labour costs, is what theory would predict and is socially efficient. Automation involves the substitution of capital for labour which is not socially efficient when the supply of labour is increasing. The possible implications for growth in *total* factor productivity (the efficiency with which labour and capital are combined to produce output) is, however, a cause for concern. The pattern of employment growth in the US may be in conflict with the objective of boosting long-run competitiveness. However, the US is a relatively closed economy and therefore loss of competitiveness is much less significant for long-term employment performance as it would be in the case of an extremely open economy such as Ireland.

At a more general level, the American experience is sometimes seen as being inapplicable to Europe, as it is based on a different model of society. In the United States, strong individualistic values are reflected in a less regulated labour market and a less generous welfare state. Such a model of society differs from that reflected in policy in most European societies, which fosters tighter labour market regulation and a stronger welfare state provision. The pattern of labour market and welfare policies in turn reinforces the differing social attitudes and political values which are characteristic of Europe and the US.

5.2 Recent Changes in the Employment-intensity of European Growth

An interesting development in Europe in recent years is that the recovery from the mid 1980s was characterised by rapid employment growth. Over the period 1983 to 1990, there was faster employment growth in the European Community than in any previous period of the Community's history. The rate of employment growth was marginally higher than the rate of increase in the labour supply. The latter in turn reflected an increase in the total labour force participation rate, a reversal of the trend over the preceding two decades. This was heavily influenced by an increase in the participation rate of married women. Output growth was also strong, but not any more so than in previous growth periods. Hence output growth in the period 1983 to 1990 became more employment-creating than ever before (see Table 36).

Trends in the labour intensity of production are illustrated in Figure 8 below. We can see that from the mid 1980s the pattern of labour intensity in the European Community was quite close to the United States. Ireland, however, did not participate in this movement towards a more employment-generating form of growth. Using the GNP measure of labour intensity (and allowing

for differences in position in the economic cycle), Ireland did follow the European Community up to 1986. But once GNP growth resumed in Ireland after 1986, there was a rapid decline in labour intensity (rapid labour productivity growth). This trend was not wholly cyclical in origin, since changes in labour intensity primarily reflected underlying changes in the structure of output.

TABLE 36
Average Annual Growth Rates of Employment and Output European Community, Various Sub-Periods 1960-1990

	Employment	Output	Employment Intensity ¹
1960-65	0.4	5.0	0.08
1968-74	0.6	4.4	0.14
1975-80	0.4	3.1	0.13
1983-90	1.0	2.9	0.34

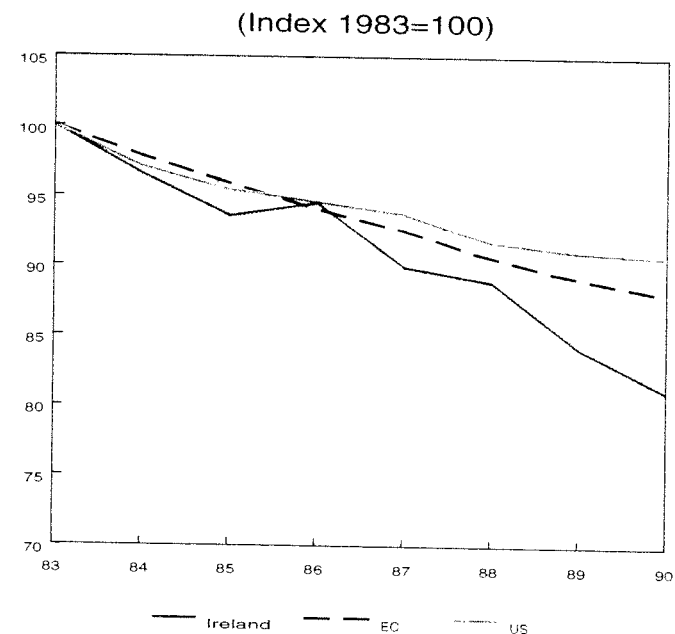
¹ Annual average employment growth as a proportion of annual average output growth.

Source: *European Economy*, December 1991.

An alternative way of expressing the change to a more employment-generating form of growth in the EC during the 1980s is to consider changes in the employment threshold. The employment threshold is defined as the minimum rate of growth of real GDP that must be reached before employment begins to grow. The threshold has been declining in most countries, as shown in Table 37 below. For Ireland, however, the employment threshold is estimated to have risen in the second half of the 1980s, to a level which was twice the average for the EC as a whole.

FIGURE 4

Labour Intensity of Production¹ Ireland, EC and US, 1983-1990



¹ Number of units of labour employed per unit of output.

Source: See Figure 3.

TABLE 37
Employment Thresholds for the Community^a

(In % Per Year)

	1961-73	1973-79	1979-85	1985-91
IRELAND	4.3	4.4	2.7	3.2
EUR 12	4.4	2.2	1.9	1.6

^a Constant term in a seven-year moving average linear regression of real output growth on employment growth.

Source: *European Economy*, December 1991.

These developments raise two questions. Firstly, why did European output growth become more employment-generating in the 1980s? Secondly, why did Ireland not participate in this general trend?

The factors behind the more employment-generating growth in the European Community have been addressed recently.⁷¹ The following factors were identified as having contributed to the change:

(a) Changes in the Combination of Factors of Production

For the Community as a whole, the 1980s saw sustained wage moderation. Real wages in Ireland also grew more moderately in the 1980s compared to the 1970s. However, the rate of increase in Ireland in the early 1980s was more than twice the EC average (1.5% against 0.7%), while falling relative to the EC average over the period 1986-90. The average annual percentage change in real wages in the Community fell from 3.8% in the 1970s to 0.7% in the early 1980s, rising to just under 2% in the late 1980s. This reflected a general policy stance to increase the anti-inflationary credibility of governments, not least through exchange rate policies and a growing emphasis on external competitiveness. The combination of wage moderation and relatively high levels of real interest rates tended to reverse the relative position of factor costs which had prevailed in the 1970s. As a result, fixed capital formation in the 1980s was of a capital widening, rather than a capital deepening nature. The result was a more labour-intensive combination of factors. This pattern of wage moderation and interest rate behaviour reflected the prevailing stance of fiscal and monetary policies which sustained expectations of medium-term growth. The declining share of wages in GDP may reflect an additional factor, namely changed behaviour in the wage determination process.

(b) Changes in the Structure of Employment

Where economic growth results in an increase in the share of total output derived from services, the relatively labour-intensive character of services will tend to increase the employment content of growth. Services employment is also more likely to be of a part-time nature.

Over the period 1983-1989, the share of services employment in total employment in the EC (excluding Spain and Portugal) increased by 8%, to reach 60.9% of total employment. For Europe as a whole, over the period 1983-1989 services accounted for 8.2 percentage points of the increase in total employment, balancing a decline of 1.2 percentage points due to declining agricultural employment and 0.5 percentage points due to a decline in industrial employment. Services employment growth was therefore a very significant element in the increase in total employment within the Community. This in turn was associated with a fall in productivity in services

in the 1980s, close to the low productivity pattern which is a long-standing feature of the US economy.

Despite the unique composition of Ireland's output growth in the second half of the 1980s, Ireland was very much in line with the European employment pattern, with employment growth in services offsetting declining employment in agriculture and (until 1987) in industry. However, as we have seen in Section 4, the average annual rate of increase in services employment in Ireland in the 1980s (1.2%) was significantly lower than that of the EC as a whole (2.1%). The growth in services employment in Ireland in the 1980s was lower than in the 1970s, while services employment in the EC grew faster in the 1980s. This difference primarily reflects the strong impact of reduction in non-market services employment in Ireland arising from fiscal retrenchment. The net effect is that Ireland did not experience the benefits of faster growth in services employment in the 1980s which contributed significantly to the more employment-intensive growth which characterised the EC in the 1980s.

(c) Part-Time Employment

Other things being equal, a shift from full-time to part-time work would tend to increase the total number of employees. For the period 1983-1989, total employment in the Community (excluding Spain and Portugal) increased by 6.4%. Of this increase, 53% was due to an increase in the numbers employed on a part-time basis, the balance full-time. In Ireland over the same period total employment fell by 1.9%. All of the decline in employment over that period was due to a decline in full-time employment, partly offset by a rise in part-time employment representing 0.7 percentage points increase in total numbers employed. While the numbers employed on a part-time basis grew more rapidly in the EC 10 than in Ireland, the increased numbers employed on a full-time basis contributed just as much to total employment growth. Full-time employment in Ireland fell over the same period. It follows that changes in the level of part-time employment did not contribute disproportionately to the more favourable employment performance of the EC economy as a whole relative to Ireland.

71 *European Community*, December 1991.

In 1989 the share of part-time employment in Ireland, the EC-10 and the US was as follows:

	MEN		WOMEN	
	% PART-TIME 1989	% CHANGE 1983-89	% PART-TIME 1989	% CHANGE 1983-89
IRELAND	3.4	41.7	15.3	28.6
EC 10	3.8	65.2	30.8	10.8
US	10.0	-7.4	25.2	-5.6

Part-time employment is less significant in the Irish labour market than in the EC as a whole, especially as regards women in employment. Part-time employment is more significant in the US labour market for men but, for both men and women, the share of part-time employment in the US has declined slightly in recent years.

Survey data indicate that 48% of part-time workers in Ireland would prefer to work full-time, compared to an average for the Community of 37%. Conversely, only 7% of full-time workers in Ireland would prefer part-time work, compared to 22% for the Community as a whole. The dominance of full-time employment in Ireland is reinforced by evidence concerning workers' preferences.

(d) Average Working Time

Other things being equal, reduced working time per worker will tend to increase the level of employment expressed in terms of the number of employees. Because of productivity growth, the increase in employment would be less than the rate of decrease in average hours worked. In practice, for the Community (less Spain and Portugal), the decline in hours worked from 1983 to 1989 was 1.8%. Average hours worked per employee in Ireland remained virtually constant, and were 10% higher than the average for the Community as a whole in 1989. Similarly longer working hours were recorded in the other peripheral member States. It follows that some of the more favourable employment experience of the EC as a whole, relative to Ireland, may be attributed to a relatively longer working week here, although this is a fairly minor influence.

Summary

In conclusion, we can observe that over the long-run the North American employment growth pattern has been impressive, having regard to the

relatively modest rates of output growth achieved. This has been possible through a concentration on low productivity, service employment. The result has been a decline in real average earnings for a much larger employed labour force.

In the recovery period of the 1980s, the EC exhibited some of these properties, resulting in an unprecedented rate of employment growth. Ireland too showed indications of a greater emphasis on services employment and a moderation in real earnings growth relative to past trends. However, important differences in the structure of output growth in Ireland, combined with differences in productivity trends *within* the manufacturing and service sectors, have meant that, despite quite creditable rates of employment growth, the employment-intensity of economic growth remained relatively low.

6. CHARACTERISTICS OF RECENT IRISH GROWTH

In Section 2, we noted that the employment-intensity of economic growth in Ireland during the recovery period of the late 1980s was low relative to other countries.⁷² While employment grew strongly in Ireland in the years 1987-90 (by an average of 1.4% per annum), the rate of output growth (4.9% per annum) was such that an even *better* employment performance might have been expected. In this section, we examine the characteristics of recent Irish growth to consider why a given rate of output growth in Ireland should have produced a lower rate of employment growth than elsewhere.

Much of the explanation for the relatively low employment-intensity of growth in Ireland in the recent past may be found in the detailed discussion of sectoral trends and changes in the international pattern of output and employment growth contained in earlier chapters of this report. Three factors in particular set Ireland apart from most other countries in terms of the structure and composition of its recent output growth, namely:

- (i) the exceptionally high, and growing, share of output growth accounted for by manufacturing industry in Ireland;
- (ii) the very rapid rate of productivity growth in Irish manufacturing industry, and
- (iii) the unusually severe contraction in the non-market services sector in Ireland during the second half of the 1980s.

All three of these factors served to reduce the employment-intensity of economic growth in Ireland relative to other countries, as will be shown below.

(i) Increasing Share of Manufacturing Industry in Output Growth

A distinctive feature of Ireland's economic growth in the late 1980s was the high and increasing share of growth accounted for by the manufacturing sector. In 1970-79 the transportable goods sector⁷³ accounted for 27.7% of

the total growth in GDP at constant factor cost. In 1986-1990, its share of measured output growth had risen to 53.1% (see Table 38). The counterpart of this has been a fall in the share of growth coming from the services sectors and, in particular, from *non-market* services. The growing share of industry in Irish output growth is in direct contrast to the international norm. Typically countries have experienced an *increase* in the share of services in growth and a decline in the share of manufacturing.

TABLE 38
Sectoral Composition of Output Growth in Ireland,
1970-79 Versus 1986-90

	1970-1979	1986-1990	
		Unadjusted Data	Adjusted for Profit Outflows ²
Agriculture	3.7	11.5	13.4
Industry	42.0	58.7	52.0
- Transportable Goods	(27.7)	(53.1)	(45.5)
- Building	(10.9)	(3.4)	(2.6)
- Utilities	(3.4)	(2.2)	(3.9)
Services	54.3	29.8	34.6
- Market	(37.1)	(32.2)	(37.4)
- Non-Market	(17.2)	(-2.4)	(-2.8)
Total³	100.0	100.0	100.0

¹ % of growth in GDP at factor cost, measured in constant prices. The GDP total used excludes the (negative) "Adjustment for Financial Services". See Eurostat National Accounts 1980-1988, Vol. 2C, pp. 17-18, for discussion.

² Sectoral GDP data have been adjusted by deducting 50% of profit outflows from the industrial sector to control for the possible effects of transfer pricing. See Section 3 (ii) for detailed discussion of this approach.

³ Total may not add to 100 due to rounding.

Source: Sectoral GDP data and details of outflows of profits, royalties and dividends by sector supplied by CSO.

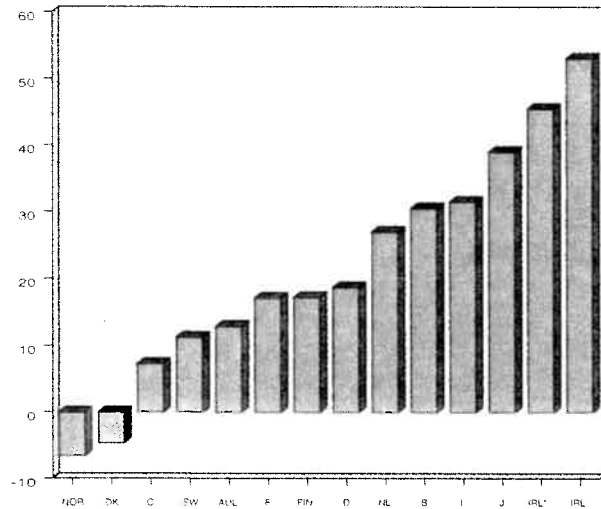
Industry's contribution to economic growth in Ireland has been overstated in recent years by the effects of transfer pricing (recall Section 3.2 (ii)). This has the effect of exaggerating the extent of change in the composition of Irish growth, by overstating the proportion of growth attributable to manufacturing industry and understating the contribution of other sectors, notably services.

⁷² Ireland was not *unique* in having a low employment-intensity of growth during this period. Within the EC, three countries (Denmark, France and Italy) experienced slightly *lower* employment-intensity than Ireland in 1985-90. It remains the case, however, that Ireland's employment-intensity was lower (and often substantially lower) than most other EC and non-EC countries at this time. Recall Table 9 of Section 2 for comparison of individual country performances.

⁷³ The Transportable Goods Industry includes manufacturing, plus mining, quarrying and turf. Sectoral GDP data are not available for the manufacturing sector alone.

To allow for this problem, we have adjusted the 1986-1990⁷⁴ data in Table 38 by deducting 50% of the value of profit repatriations from the industrial sector. This allows us to develop a crude estimate of how the structure of Ireland's economic growth might look in the absence of transfer pricing, and provides a reasonable basis for comparison with other countries.⁷⁵ The final column of Table 38 shows that, even after correcting for profit outflows, the share of the transportable goods industry in Irish economic growth has risen substantially since the 1970s, to about 45.5% in 1986-1990.

FIGURE 5
Share of Manufacturing Industry in Output Growth,
OECD Countries 1986-90
Manufacturing as % Total GDP Growth



IRL*: Data for Ireland have been adjusted to allow for the possible effects of transfer pricing by deducting 50% of profit outflows from the industrial sector. See text for explanation.

Source: OECD (1992), National Accounts. Irish data: GDP data for the Transportable Goods sector and details of profit outflows from the Agriculture/Industry sector supplied by CSO.

The share of manufacturing industry in Irish economic growth during 1986-90 was higher than in any of the other thirteen countries for which we have data (See Figure 5). This conclusion holds even *after* an adjustment has been made to allow for the possible effects of transfer pricing on the Irish data (See IRL* in Figure 5). Since the employment-intensity of growth in

the manufacturing sector is low relative to other sectors, an above-average representation of manufacturing industry in the overall composition of growth will tend to reduce the employment intensity of growth for the Irish economy as a whole.

(ii) Rapid Productivity Growth in Irish Manufacturing Industry

A second factor contributing to the low employment-intensity of growth in Ireland in recent years has been the exceptionally fast rates of productivity growth recorded in manufacturing industry. Not alone has manufacturing industry accounted for a high *share* of output growth in Ireland relative to international trends, but the *employment-intensity* of Ireland's manufacturing growth has itself been very low relative to other countries, thereby accentuating the impact of the initial compositional effect.

In many ways, these two factors reflect different sides of the same phenomenon: it is clear from Section 3 that the very rapid growth of manufacturing output in Ireland during the 1980s was not simply *accompanied* by a substantial rise in labour productivity, but was itself made possible by the large scale changes in the structure of manufacturing industry which *caused* much of that productivity rise. To treat the growth of output and productivity as two distinct and separable phenomenon would be to ignore this crucial interdependency.

In Section 3, we saw that the rate of labour productivity growth in manufacturing industry in Ireland during the 1980s was unusually high by international standards. We saw further that this high rate of productivity growth could not be attributed solely to the effects of transfer pricing, but reflected important underlying characteristics of Irish manufacturing growth. In particular, it was clear that the *extent* of structural change in manufacturing industry in Ireland over the past two decades has been significantly greater than elsewhere, and that this shift has resulted in a dramatic increase in the share of manufacturing output growth coming from high-tech sectors, with relatively high rates of productivity growth.

74 No information is available on profit outflows prior to 1984

75 Full details of this approach and the underlying methodology were given in Section 3.2 (ii).

TABLE 39

**Annual Average Growth Rates of Manufacturing Output,
Employment and Productivity, 1984-1989 OECD Countries**

% Change per Annum

	Output* (Vol)	Employment	Output per Employee
Ireland (1984-90)			
(a) Recorded Growth Rates	7.6	0.7	6.9
(b) Adjusted for Profit Outflows ³	6.2	0.7	5.5
Finland	3.4	-2.3	5.7
Japan ²	5.5	0.4	5.1
UK ²	4.1	-0.5	4.6
Italy	3.9	-0.3	4.2
USA ¹	3.6	-0.5	4.1
Belgium ²	1.8	-1.5	3.3
France	1.2	-1.9	3.1
Australia ²	3.8	1.5	2.3
Canada	3.2	1.7	1.5
Netherlands ²	2.7	1.4	1.3
Norway ²	0.1	-1.2	1.3
Germany	1.6	0.8	0.8
Sweden	1.7	1.1	0.6
Denmark	0.1	1.1	-1.0

* GDP arising in manufacturing.

¹ 1984-1987.

² 1984-1988.

³ Deducting 50% of the value of profit outflows from the industrial sector to allow for the possible effects of transfer pricing (see Section 3.2 (ii) for discussion).

Source: OECD International Sectoral Databank. Irish data: GDP arising in the Transportable Goods Industry and details of profit outflows from the Agriculture/Industrial Sector were supplied by CSO; Employment in Transportable Goods Sector from Labour Force Surveys.

Note: Countries have been ranked on the basis of the growth in manufacturing productivity, 1984-1989.

In addition, we noted that the gap between productivity levels in high-tech and low-tech industry in Ireland was exceptionally wide by international standards, thus increasing the impact of structural change on the aggregate level of manufacturing productivity. While this effect is once again

exaggerated by the impact of transfer pricing, a substantial element of it reflects a genuine "productivity gap" between traditional, low-tech industry in Ireland (which is pre-dominantly Irish-owned) and the more modern, high-productivity sectors (which are heavily dominated by overseas industry).

Table 39 contrasts the rate of growth of manufacturing output, employment and productivity in Ireland during 1984-1990, with that of other OECD countries in 1984-1989.⁷⁶ Manufacturing productivity in Ireland grew by about an average of 6.9% per annum over the period, a rate considerably in excess of even the next highest country (Finland, with 5.7% per annum productivity growth). If we adjust the Irish data to allow for the possible effects of transfer pricing,⁷⁷ productivity growth falls to an average of about 5.5% per annum, which is still exceptionally high by international standards. This unusually high rate of productivity growth in manufacturing industry has served to reduce the overall employment-intensity of economic growth in Ireland relative to that of other countries.

(iii) Contraction of Non-Market Services

The third, major factor contributing to a relatively low employment-intensity of growth in Ireland in recent years has been the severity of the slowdown, and subsequent contraction, of Ireland's non-market service sector. In Section 4, we saw that Ireland was unique in having experienced a *decline* in non-market service employment during the period 1985-90. In most other countries at this time, slow (but positive) growth in non-market service employment was recorded, and a small number of countries experienced more substantial rates of increase.⁷⁸

The contraction of non-market service employment in Ireland during the second half of the 1980s had its origins in the unsustainable expansion of that sector in the 1970s. The expansionary fiscal policy pursued in the late 1970s increased the employment-intensity of economic growth at that time, but at the cost of reducing it the following decade, as the necessary process of fiscal correction began to take effect. The swings in Ireland's fiscal policy over the past two decades have, therefore been reflected in similar swings in employment-intensity, initially driving Ireland's employment-intensity

⁷⁶ 1989 is the latest year for which data for these countries are available.

⁷⁷ See Section 3.2 (ii) for discussion.

⁷⁸ Notably Spain, with 4.8% per annum growth in non-market service employment in 1985-89. Portugal (1.6% per annum) and Germany (1.5% per annum) also experienced above-average growth in non-market services employment at this time.

above its "policy neutral" level and then, in the late 1980s, forcing it to drop below that level.

In Europe during the latter half of the 1980s, several countries experienced a rise in employment-intensity, which helped to push average employment-intensity in the EC up towards OECD levels. Two factors contributing towards the rise in employment-intensity in these countries were the rise in the share of (labour intensive) services as a proportion of total output growth, and a slowdown in the rate of productivity growth within the services sector. In Ireland, the contraction in non-market services during 1985-90 militated against both of these tendencies: firstly, the share of services in Irish economic growth during the late 1980s was held back, not alone by the very rapid growth of manufacturing industry (discussed above), but also by the contraction of output growth in the non-market services sector. Table 38 above showed that the contribution of non-market services to output growth in Ireland fell from a substantial positive (of 17.2%) in 1970-79 to a small *negative* (of 2.4%) in 1986-90. This significant turnaround in non-market services accentuated the already-unusual composition of Irish economic growth in these years. Secondly, as was pointed out in Section 4, the reduction in non-market services employment in Ireland after 1985 exerted upwards pressure on productivity growth rates within the Irish service sector as a whole. The effect of this was to partially offset the impact of falling productivity growth in the *market* services sector, thus contributing towards a *smaller* reduction in service productivity growth rates in Ireland than in most other European countries.

7. AREAS FOR FURTHER EXAMINATION

This Report has described the historical association between economic growth and employment growth in Ireland and in other Western economies and has highlighted how this relationship has varied over time both within countries and between different countries.

Among the main findings emerging from this review are the following:

- (a) Ireland's rate of *employment growth* (0.3% p.a.) has been in line with that of other late-developing European countries (e.g. Spain and Greece) while being slightly below the average rate of employment growth for the EC as a whole (0.4% p.a.). However, Ireland's employment growth rate has been substantially below the average annual rate of employment growth in the OECD over the period 1960-1990 (1.1% p.a.), which is more than three-and-a-half times the EC average.
- (b) There has been a dramatic difference in *the average labour-intensity of growth* between the EC and non-EC OECD economies: in the EC, every 1% increase in GDP during 1960-1990 was associated with a rise in employment of just 0.12%; in non-EC economies such as the US, Canada and Australia, the equivalent employment rise was between 0.56% and 0.59%. Ireland, in common with other late-developing European economies, lies at the *lower* end of the European spectrum with regard to employment intensity. For the EC generally and for Ireland in particular, the poor employment performance of the past thirty years relative to non-EC countries owes more to the substantial differences in the average employment-intensity of growth than to the (relatively small) differences in the long-run rate of economic growth.
- (c) The *long-run decline in agricultural employment* has played an important part in reducing the aggregate employment intensity of growth in Ireland relative to that of other countries. The relatively large size of Ireland's agricultural sector meant that reductions in agricultural employment had a disproportionate impact on Ireland's overall output/employment relationship. Over the period 1960-90, the average rate of growth in non-agricultural employment (1.3%) was significantly better than the EC average (0.9%), although low relative to a number of the less-developed members of the Community, such as Spain and Greece, as well as to the average for the OECD as a whole. The significance of the agricultural sector for employment trends has diminished significantly and has only a modest impact on the current employment-intensity of growth.

(a) Since the mid 1980s, there has been a *rise* in the employment-intensity of economic growth in the EC, bringing it closer to the non-European norm. Significantly, Ireland has failed to participate in this general European trend, so that the gap between the employment-intensity of growth in Ireland has widened relative to other countries. This is due to changes in the structure and composition of growth, especially the increasing share of manufacturing output, the rate of productivity growth in manufacturing in Ireland, and the contraction of non-market services employment in the late 1980s.

It is clear that the *extent* to which economic growth impacts on employment growth is determined as much by the structure and composition of growth, as by the absolute rate of growth. It is also clear that recent trends in the structure and composition of Irish growth have tended to *reduce* the employment intensity of Irish growth relative to other countries.

Given the central importance of maximising employment growth in Ireland, the question arises as to whether it is plausible to think and plan in terms of a consciously employment-oriented growth strategy? i.e. is it plausible to plan for economic growth led by the services sector or by labour-intensive activities in manufacturing industry? A further question to be addressed is that of what labour market conditions will maximise the employment yield from a given growth rate in national output and distribution of that growth rate across sectors? The Council proposes to address these issues in the next phase of this project. This section identifies four themes which will be considered in the course of this work.

1. *Relieved Development*

This paper has highlighted the growing share of manufacturing in Ireland's growth. Strong growth in manufacturing is not in itself a problem. However, the impact of this growth on the rest of the economy, and especially on the demand for labour, has been shown to be significantly less than elsewhere. The characteristics of growth in Irish manufacturing industry reflect, in turn, the successes and failures of Irish industrial policy: the success of industrial policy in attracting large volumes of foreign direct investment to Ireland has produced significant benefits, allowing for the rapid "modernisation" of Irish industry, the introduction of entirely new sectors of manufacturing and the creation of substantial numbers of jobs. It has also inevitably stimulated faster growth in output and productivity than would otherwise have occurred, thus contributing directly to a fall in employment intensity, not just within the manufacturing sector itself, but also within the wider, national economy. The reasons for this include the concentration of overseas industry in

rapidly-growing, high-tech sectors of manufacturing industry, the higher levels of average productivity in overseas firms relative to existing Irish-owned industry, and the fact that both of these influences are exaggerated by the effects of transfer pricing. At the other end of the spectrum, the failure to develop a strong indigenous base has accelerated the rise in productivity levels in manufacturing industry (and, hence, *hastened* the decline in employment intensity) by allowing a very sharp reduction in the significance of the relatively labour intensive medium and low-tech sectors.

If the employment intensity of growth is to be increased then the development of the manufacturing sector in a more balanced way and in a manner which increases its integration with the rest of the economy should have priority. This question has implications for all aspects of industrial policy, and makes it particularly important to identify examples of strategies which have boosted employment generated indirectly by the high-tech sector and directly in viable medium and low-tech industries. It also raises the need to examine whether, on balance, industrial policies (widely defined to cover all relevant areas of public policy) and their implementation are biased towards the attraction of inward investment rather than the development of indigenous industry.

2. *Relative Factor Costs*

Experience elsewhere shows an important role for relative factor costs in influencing the employment intensity of growth. The impact of relative factor costs on employment intensity in Ireland, and the role of policy variables in influencing this warrant further consideration. Sustained wage moderation and relatively high levels of real interest rates have been identified as fostering employment intensive growth in the European Community generally from the mid 1980s. In Ireland, the increase in gross real wages, driven by a rising tax wedge and the associated loss of price competitiveness has been shown elsewhere to have played a role in the decline in employment in the first part of the 1980s. But in the recovery in the latter part of the 1980s, Ireland experienced wage moderation and a gain in labour cost competitiveness. Why then did Ireland not participate in the European trend of more employment intensive growth?

Firstly, in the market services, there *was* some indication of a lower decline in labour intensity than before. Secondly, the necessary correction of the public finances resulted in reduced employment in non-market services in contrast with most European countries. But the distinctive feature of Ireland's growth in this period was the exceptionally strong growth in manufacturing.

The long-run demand for labour in manufacturing has been found to be quite sensitive to the price of labour⁷⁹. This means that labour costs are significant influences on the level of manufacturing employment. However, the foreign, high-tech industries which have contributed most to the growth of manufacturing output in Ireland have relatively low labour costs as a proportion of total inputs. Changes in labour costs are therefore more likely to influence their choice of location for investment, rather than the mix of capital and labour. This reflects the fact that there is very limited scope for substitutability of factors of production within the high-tech manufacturing sector. Therefore, while factor costs are significant influences on the investment and locational decisions of high-tech firms, they cannot explain the employment intensity of output in these sectors. Labour costs may, of course, influence the employment intensity of foreign firms overall, through their greater significance for firms using more labour intensive technologies or producing more labour intensive products.

On the other hand, however, it should be noted that some other European countries (for example, the Netherlands) which experienced more employment intensive growth during the 1980s had greater wage moderation than Ireland. Furthermore, there is evidence that the demand for labour in services is more sensitive to the relative costs of labour and capital than demand for labour in industry.⁸⁰

It follows that further comparative analysis of the implications for policy of the significance of (i) relative factor costs and (ii) wage levels and their determination, would be desirable.

3. Profitability

The level of investment in employment generating activities depends fundamentally on profitability. The relative *profitability* of such investment in Ireland needs to be examined and factors which restrict profitability addressed.

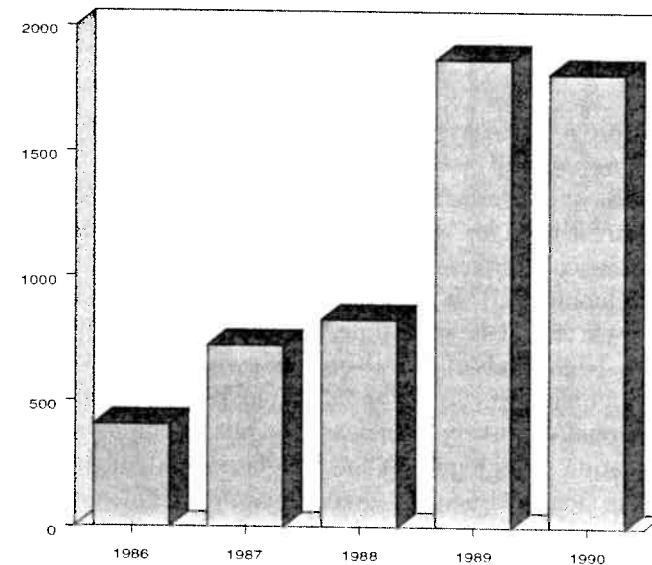
The level of operating surplus as a percentage of gross value-added in industry in Ireland appears to be in line with other countries, and appears higher than in Germany and Spain. These figures, however, include the profits recorded by the multinational sector in Ireland and so portray Ireland's profitability in an unduly favourable light. OECD data suggest that the return

79 See Bradley and FitzGerald (1988).

80 See Bradley, FitzGerald and Kearney (1991).

on capital in the Irish business sector is relatively low. The estimated rate of return on capital in Ireland in 1989 was 9.2% compared to an OECD average of 15.4% (OECD, 1992, Economic Outlook). Furthermore, profitability data for the manufacturing sector, available from the IDA's Irish Economy Expenditure survey, point to very low profitability among Irish-owned industry, with an average return on sales of just 2.1% for the period 1983-1989. In recent years there has been a sharp increase in business savings (retained earnings) up almost 6% of GNP since 1984. This increase in business savings has not been matched by an increase in domestic investment. Most of the increase in business savings has been used to acquire foreign assets. The household section has also been acquiring foreign assets. These developments are reflected in a rising level of private capital outflows.⁸¹

FIGURE 6
Private Capital Outflows IR£ million



Source: CSO, National Income and Expenditure 1991.

It could be argued that, since investment grew strongly in the late 1980s, the export of capital did not restrict the economy's development. But a considerable proportion of the productive investment in this period was made by the multinational sector. More domestic investment would reduce the need

81 See Honohan (1992) for a detailed examination of financial flows in Ireland.

to attract foreign investment and potentially contribute to more integrated and employment intensive growth. While investments overseas are not solely determined by assessments of the profitability of overseas projects relative to those potentially undertaken in Ireland, profitability is likely to be a critical factor.

A more refined assessment of Ireland's profitability and of the institutional and other factors which may contribute to the outflow of Irish savings is needed, if meaningful conclusions about Ireland's experience are to be drawn.

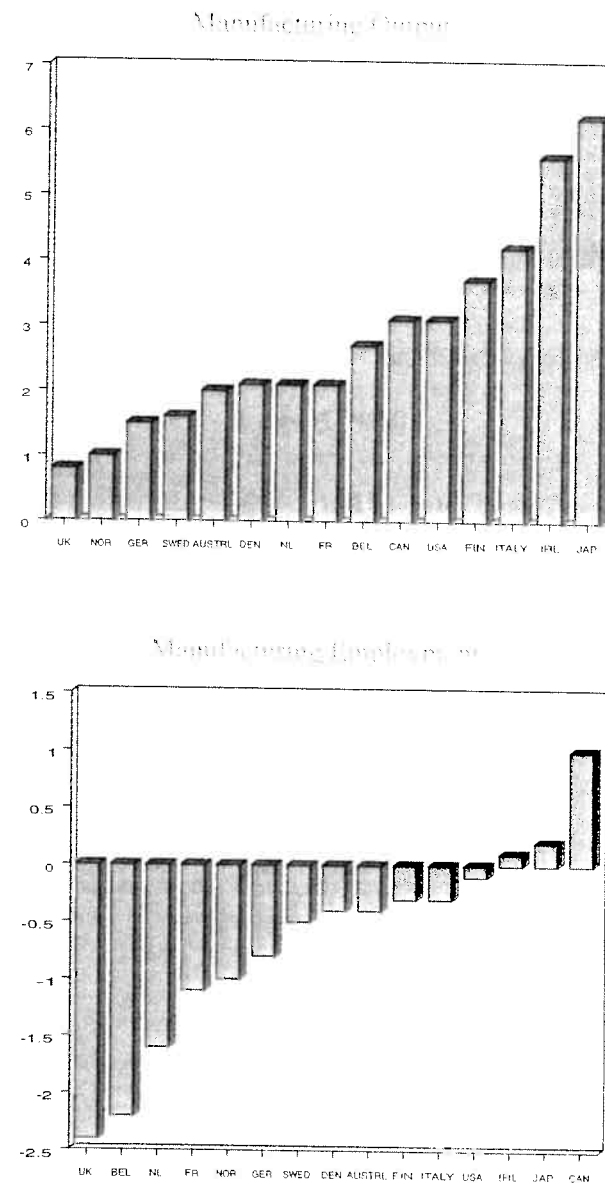
3. Public Sector

Changes in public sector employment in Ireland played a significant role in reducing the employment intensity of growth in the late 1980s and boosting employment-intensity in the 1970s in an ultimately unsustainable manner. The significance of levels of public service employment in the more employment-intensive growth of other European countries, and the conditions under which such employment proved sustainable, merit further analysis.

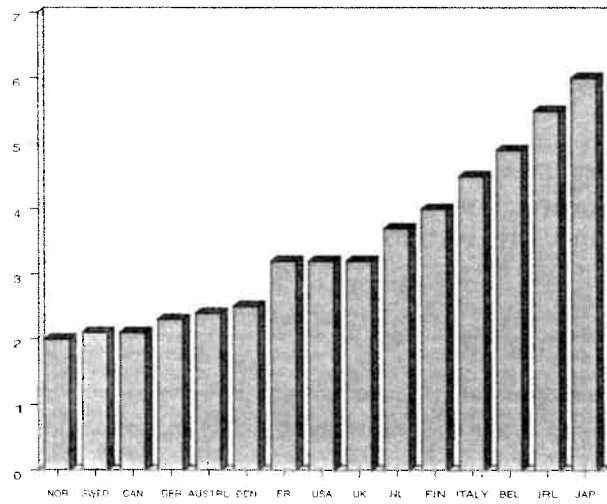
The Council proposes to examine these issue in the second phase of this project. In doing so it will be seeking to develop in a comparative perspective the implications of the particular emphasis which it placed in *A Strategy for the Nineties* on the need for "a radical policy programme to improve internal efficiency, enhance international competitiveness and overcome barriers to long-run development". This is necessary if we are to sustain high rates of economic growth and, at the same time, to increase the employment-intensity of that growth. High levels of growth on their own are not a guarantee of high rates of employment growth; increased employment-intensity at low levels of growth is equally unlikely to increase the rate of employment growth. It is the combination of high growth and a higher employment content which is necessary to achieve society's goals regarding employment and living standards. The Council believes that the experience of other countries is a useful and relevant basis for analysing the scope for better employment performance in Ireland. This will be the focus of a further report which will form the second phase of this project.

APPENDIX I

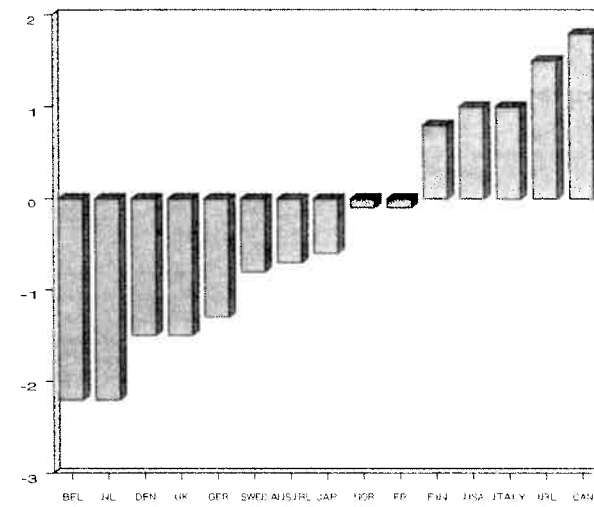
FIGURE I
Average Annual Growth Rates of Manufacturing Output,
Employment and Productivity, OECD Countries.
Period: 1970 - 1989
% Change per annum



Output Per Employee



Manufacturing Employment



Note: For underlying data and sources, see Table 10 of the main text.

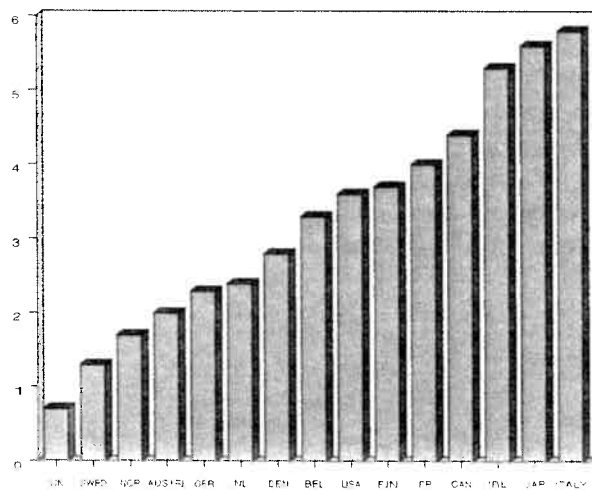
APPENDIX 1

FIGURE 2

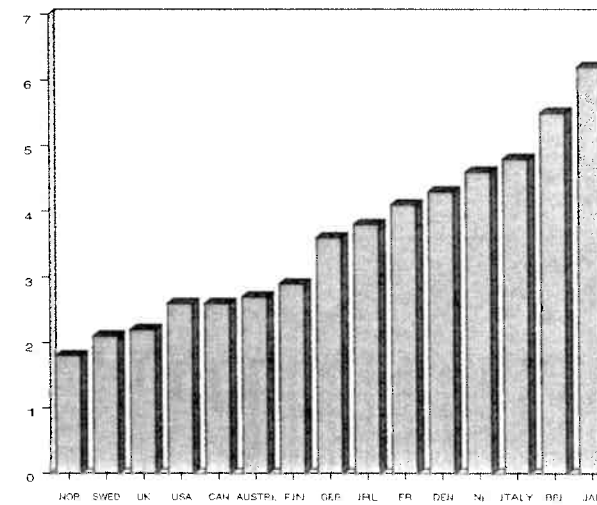
Average Annual Growth Rates of Manufacturing Output, Employment and Productivity, OECD Countries.

Period: 1970 - 1979
% Change per annum

Manufacturing Output



Output Per Employee



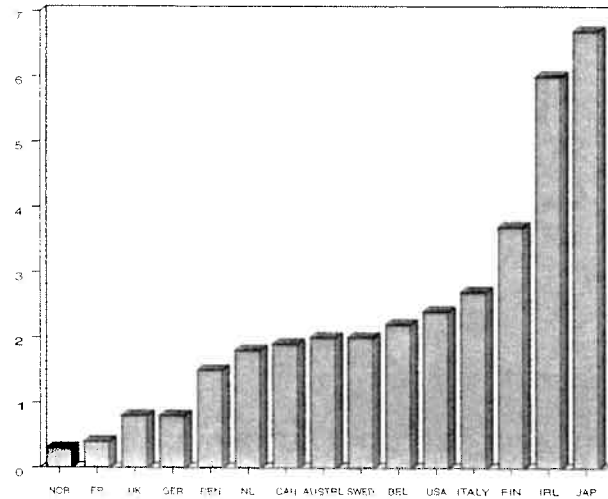
Note: For sources and underlying data, see Table 11 of main text.

FIGURE 3

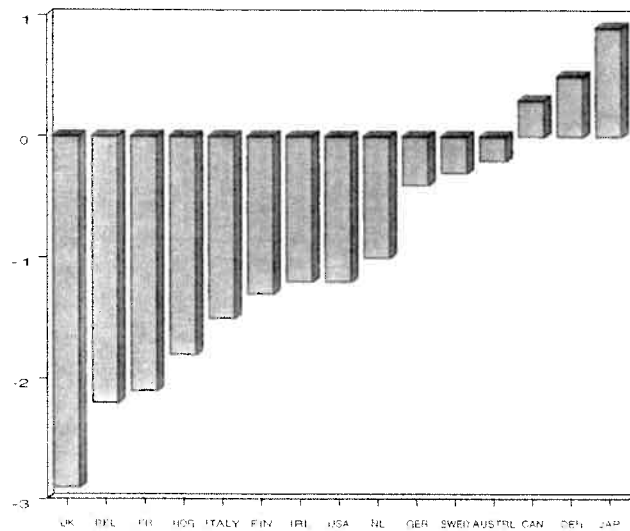
Average Annual Growth Rates of Manufacturing Output, Employment and Productivity, OECD Countries.

Period: 1979 - 1989
% Change per annum

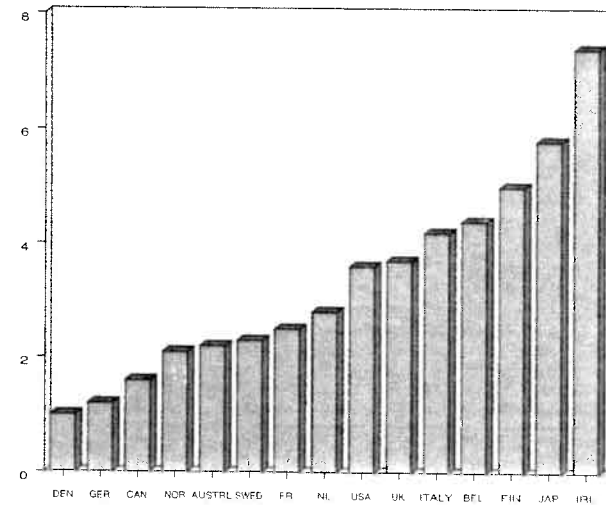
Manufacturing Output



Manufacturing Employment



Output Per Employee



Note: For sources and underlying data, see Table 11 of main text.

**Sectoral Trends in Output, Employment and Productivity;
Manufacturing Industry; Ireland 1973-1990**

		Annual Average % Change			
High Tech		1973-79	1979-86	1986-90	1973-90
Pharm.	O	+23.2	+ 7.2	+12.9	+14.0
	E	+ 7.6	+ 8.0	+ 7.3	+ 7.7
	P	+15.6	- 0.8	+ 5.6	+ 6.3
D+DP	O	+41.0	+33.8	+20.5	+33.0
	E	+20.1	+11.4	+ 4.4	+12.7
	P	+20.9	+22.4	+16.1	+20.3
Elect. Eng.	O	+ 3.7	+12.1	+22.3	+11.3
	E	+ 3.6	+ 3.2	+ 6.6	+ 4.2
	P	+ 0.1	+ 8.9	+15.7	+ 7.1
Instr. Eng.	O	+ 7.2	+ 6.7	+10.3	+ 7.7
	E	+17.1	+ 1.3	+ 2.8	+ 7.0
	P	- 9.9	+ 5.4	+ 7.5	+ 0.7
Medium Tech		1973-79	1979-86	1986-90	1973-90
Prelim. Metal Proc	O	- 1.7	- 1.5	+ 7.1	+ 0.4
	E	- 8.0	- 5.9	- 0.4	- 5.4
	P	+ 6.3	+ 4.4	+ 7.5	+ 5.8
Chemicals (incl. Pharm.)	O	+14.1	+ 6.6	+10.6	+10.1
	E	+ 3.3	+ 0.4	+ 2.8	+ 2.0
	P	+10.8	+ 6.2	+ 7.8	+ 8.1
Mech. Eng.	O	+ 9.4	+ 1.3	+ 5.9	+ 5.2
	E	+ 6.7	- 0.5	+ 1.8	+ 2.5
	P	+ 2.7	+ 1.8	+ 4.1	+ 2.7
Motor Vehicles	O	- 4.0	-13.5	+10.1	- 5.0
	E	- 3.0	-11.5	+ 2.2	- 5.4
	P	- 1.0	- 2.0	+ 7.9	+ 0.4
Other Transport	O	- 1.2	- 2.2	+ 2.6	- 0.8
	E	- 0.9	- 4.7	+ 0.3	- 2.2
	P	- 0.3	+ 2.5	+ 2.3	+ 1.4
Misc. Ind.	O	+ 6.4	+ 2.1	+ 5.0	+ 4.3
	E	+ 3.0	- 1.2	+ 4.3	+ 1.6
	P	+ 3.4	+ 3.3	+ 0.7	+ 2.7

O = Output
E = Employment
P = Output per Employee

Low Tech		1973-79	1979-86	1986-90	1973-90
Non-Metallic Minerals	O	+ 4.5	- 1.1	+ 4.3	+ 2.1
	E	+ 2.5	- 3.8	- 2.1	- 1.2
	P	+ 2.0	+ 2.7	+ 6.4	+ 3.3
Metal Articles	O	+ 8.1	- 4.5	+ 4.0	+ 1.8
	E	+ 5.2	- 5.1	+ 2.3	+ 0.1
	P	+ 2.9	+ 0.6	+ 1.7	+ 1.7
Food	O	+ 5.1	+ 3.3	+ 5.9	+ 4.5
	E	+ 0.2	- 3.1	- 0.4	- 1.3
	P	+ 4.9	+ 6.4	+ 6.3	+ 5.8
Drink & Tobacco	O	+ 2.7	+ 1.4	+ 3.6	+ 2.4
	E	- 0.2	- 2.7	- 6.2	- 2.7
	P	+ 2.9	+ 4.1	+ 9.8	+ 5.1
Textiles	O	+ 2.4	- 3.4	+ 4.7	+ 0.5
	E	- 2.5	- 7.1	+ 0.5	- 3.7
	P	+ 4.9	+ 3.7	+ 4.2	+ 4.2
Clothing F+L	O	- 2.5	- 3.3	- 2.5	- 2.8
	E	- 3.0	- 5.3	- 3.5	- 4.0
	P	+ 0.5	+ 2.0	+ 1.0	+ 1.2
Timber & WF	O	+ 1.0	- 3.1	+ 5.2	+ 0.3
	E	- 1.5	- 3.0	- 0.9	- 2.0
	P	+ 2.5	- 0.1	+ 4.3	+ 2.3
Paper & Print	O	+ 0.9	- 0.1	+ 6.9	+ 1.9
	E	- 0.1	- 3.2	+ 1.5	- 1.0
	P	+ 1.0	+ 3.1	+ 5.4	+ 0.9
Total Mfg. Ind.	O	+ 5.2	+ 4.2	+ 9.7	+ 5.8
	E	+ 0.8	+ 2.7	+ 1.0	- 0.6
	P	+ 4.4	+ 6.9	+ 8.7	+ 5.2

O = Output
E = Employment
P = Output per Employee

Decomposition of Employment Growth in Manufacturing Industry, Identifying Changes due to Gross Output Expansion and Changes due to Labour Productivity Growth

	High-Tech	Medium-Tech	Low-Tech	All Mfg.
1. AUSTRALIA (1974-86)				
Average Employment Growth	- 1.64	- 1.94	- 1.41	- 1.56
(% p.a.) due to:				
Output Growth	+ 1.21	+ 0.60	+ 1.73	+ 1.39
Labour Productivity Growth	- 2.84	- 2.54	- 3.14	- 2.96
2. CANADA (1981-86)				
Average Employment Growth	- 1.15	- 0.29	- 0.91	- 0.61
(% p.a.) due to:				
Output Growth	+ 5.19	+ 3.54	+ 1.18	+ 2.19
Labour Productivity Growth	- 6.33	- 3.25	- 2.09	- 2.80
3. FRANCE (1977-85)				
Average Employment Growth	- 0.95	- 2.20	- 2.45	- 2.14
(% p.a.) due to:				
Output Growth	+ 4.24	+ 0.03	- 0.04	+ 0.66
Labour Productivity Growth	- 5.18	- 2.22	- 2.41	- 2.80
4. GERMANY (1978-86)				
Average Employment Growth	+ 0.05	+ 0.39	- 2.18	- 0.93
(% p.a.) due to:				
Output Growth	+ 3.69	+ 1.99	- 0.69	+ 0.94

5. JAPAN (1970-85)				
Average Employment Growth	+ 1.30	+ 0.44	- 0.61	+ 0.18
(% p.a.) due to:				
Output Growth	+ 17.26	+ 4.89	+ 2.24	+ 6.15
Labour Productivity Growth	- 15.96	- 4.46	- 2.85	- 5.96
6. UK (1968-84)				
Average Employment Growth	+ 1.46	- 2.16	- 2.53	- 2.24
(% p.a.) due to:				
Output Growth	+ 3.11	+ 0.15	- 0.46	+ 0.24
Labour Productivity Growth	- 4.58	- 2.01	- 2.08	- 2.48
7. US (1972-85)				
Average Employment Growth	+ 2.20	+ 0.26	- 0.66	+ 0.15
(% p.a.) due to:				
Output Growth	+ 9.55	+ 0.98	+ 0.63	+ 2.47
Labour Productivity Growth	- 7.35	- 0.72	- 1.29	- 2.32

Source: OECD, Structural Change and Industrial Performance: A Seven Country Growth Decomposition Study, OECD Documents, Paris 1992.

Note: High-Tech = Pharmaceuticals, Computers and Office Machinery; Electrical Machinery; Communications and Semi-Conductors; Aerospace and Instruments.

Medium-Tech = Chemicals, Rubber and Plastic; Non-ferrous metals, Non-electrical equipment; Other Transport; Motor Vehicles, and other manufacturing.

Low-Tech = Food, Drink & Tobacco; Textiles, Footwear & Leather; Wood, Cork and Furniture; Paper and Printing; Petroleum Refining; Stone, Clay & Glass
Ferrous Metals; Fabricated metal products; Shipbuilding.

APPENDIX 4

SERVICES SECTOR: DEFINITIONS AND DATA USED

We can divide services into *market* and *non-market* services. This distinction is closely related (but not directly equivalent to) the distinction between private and public services. The distinction between the public and private sectors refers to whether *ownership* rests with either the public authorities or private agents. The distinction between the market and non-market sectors refers to the *method of financing* the activity. If the costs of production are covered by revenue from sales to buyers, then such activity is in the *market* sector. If the costs of production are covered by some type of transfer and the output is given away or rationed by some *non-price* mechanism then the activity is in the *non-market* sector.

In some cases activity can be partly in the market sector and partly the non-market sector. If a firm receives a subsidy of 10% of its costs and covers the rest of its costs from sales revenue, then 10% of its production is in the non-market sector and 90% is in the market sector. In practice, however, activity is classified in either one sector or the other, depending on what the main source of its revenue is.

The relationship between these classifications is illustrated below:

	Public	Private
Market	commercial state enterprises, e.g. Telecom	mainstream private sector, e.g. Smurfit
Non-Market	Civil service non-commercial state-agencies	non-profit private sector, e.g. private charities

The main difference between the private/public and market/non-market classifications is the treatment of commercial state enterprises. These are part of the public sector but are classified as being in the market sector rather than the non-market sector.

IRISH DATA:

The Irish data on market and non-market services has been taken from the Department of Finance databank. Non-market services includes public administration and defence, non-commercial state agencies, health (health boards and voluntary hospitals) and education (primary, secondary and third level excluding non grant-aided institutions). Local authority construction is not included in non-market services; this is classified under "construction" which comes within industry rather than services. All other services including those produced by commercial state enterprises are counted as market services.

INTERNATIONAL DATA:

For EC countries data on market and non-market services are available from Eurostat National Accounts, Detailed Tables by Branch, Vol. 2C. For other countries, the appropriate categories in the OECD International Sectoral Databank and the OECD National Accounts were aggregated to compute market services output and employment. These categories were: Wholesale and Retail Trade, Restaurants and Hotels, Transport, Storage and Communication, Finance and Insurance, Real Estate and Business Services and Community, Social and Personal Services.

For non-EC countries we do not have data on non-market services so we use the OECD category of Producers of Government Services which is defined as follows:

All department, establishments and other bodies of central, state and local governments which engage in such activities as administration, defence, health, educational and social services, and promotion of economic growth whether accounted for, or financed in, ordinary or extra-ordinary budgets or extra-budgetary funds. Includes social security schemes in respect of large sections of the community imposed, controlled or financed by government, non-profit institutions entirely, or mainly, financed and controlled by general government or mainly serving general government, and embassies, consulates and military establishments of a country located abroad.

Commercial public enterprises are excluded from this definition, so in this respect it corresponds to non-market services. Strictly speaking it does not fully correspond to the definition of non-market services, since private, non-market activities are not included. The private non-market sector, however, is relatively small. The data on government services were taken from the OECD International Sectoral Databank and the OECD National Accounts.

Particular difficulty is experienced in estimating the output of the non-market sector. In most cases no reasonable measure of output is available. In Ireland the practice adopted is to apply an index of employment, where available, to the base year remuneration. Where reliable data are not available the implied index of rates of remuneration is used to deflate current values. The effect of using this method is to assume no increase in productivity (CSO National Income and Expenditure, 1991, Appendix 1). In some other countries some productivity growth is imputed to this sector. This has the effect of increasing the rate of growth of services output in the countries concerned. The imputed rate of productivity growth is generally low so this factor is of limited significance.

Decomposition of the Increase in the Wage Bill 1971-1989

	Change in No. of Employees	Real Average Compensation per Employee	Change in wage bill as per-centage of:	
			1 Change in No. of Employees	2 Real Average Compensation per Employee
CANADA	57.5%	23.4%	60.9%	24.8%
US	52.2%	10.1%	77.3%	14.9%
JAPAN	37.1%	79.3%	25.5%	54.4%
AUSTRALIA	37.2%	-2.5%	110.0%	-7.3%
NEW ZEALAND				
AUSTRIA				
BELGIUM	1.1%	53.3%	2.0%	96.9%
DENMARK (1970)	24.5%	20.2%	49.3%	40.7%
FINLAND				
FRANCE	12.6%	46.5%	19.5%	71.5%
GERMANY (1970)	5.6%	49.0%	9.8%	85.4%
GREECE				
ICELAND				
IRELAND	12.8%	52.0%	17.9%	72.9%
ITALY	13.9%	40.8%	23.1%	67.5%
LUXEMBOURG				
NETHERLANDS 1970	7.9%	32.7%	18.3%	75.8%
NORWAY (1972)	31.2%	29.5%	44.7%	42.2%
PORTUGAL				
SPAIN				
SWEDEN				
SWITZERLAND				
TURKEY				
UK	2.8%	40.9%	6.2%	91.2%
EEC				
OECD TOTAL				

Source: Calculations based on OECD National Accounts and Labour Force Survey. Irish data based on CSO, National Income and Expenditure, Labour Force Survey and Census of Population. Note that the Real Compensation of employees is based on remuneration of employees in the National Accounts deflated by GDP (GNP for Ireland) deflation.

NOTE: The date on the front cover of the report refers to the date the report was submitted to the Government. The date listed here are the dates of publication.

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