

A NORTH/SOUTH ANALYSIS OF MANUFACTURING GROWTH AND PRODUCTIVITY

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ABSTRACT

This report emphasises the strong economic performance of Northern Ireland and the exceptional economic performance of Ireland during the 1990s. In making aggregate comparisons it is important to be aware that they reflect the composition of manufacturing industry, and in a North/South context, are therefore strongly influenced by the greater importance of high-tech industry in Ireland. Both economies are exceptionally 'open', exporting about three-quarters of manufacturing output, and both reduced their dependence on the UK market during the 1990s.

Analysis of various indicators of performance at a sectoral level highlights large disparities between industries. Individual manufacturing sectors fall into three categories: (1) a group of mature industries, where inward investment has been limited and productivity levels are broadly similar, North and South; (2) a group of mature industries which have significant differences between Northern and Southern productivity, with the advantage being predominantly with Southern firms; (3) high-tech industries where inward investment has been a dominant influence and levels of productivity appear significantly higher in Ireland. Understanding these contrasts in performance will be important if effective policy is to be developed to improve living standards throughout the island economy

Acknowledgements

InterTradeIreland would like to thank Dr Eoin O'Malley from the Economic and Social Research Institute (Dublin) and Professor Stephen Roper from the Aston Business School (Birmingham) for undertaking this research.

This research would not have been possible without the co-operation of the Irish Central Statistics Office (CSO) and the Statistics Branch, Department of Enterprise, Trade and Investment, Northern Ireland (DETI).

FOREWORD

This report provides for the first time, a detailed comparative analysis of the structure and productive performance of the Northern and Southern economies. By identifying common sectoral concentrations and significant productivity differences, the report creates the potential for improving the overall performance of the island economy through encouraging networks to share best practice and develop critical mass in industrial sectors.

The report highlights a number of similarities in the development trajectories of both economies. In particular the composition of manufacturing in both the North and the South is shifting towards more high technology intensive industries. Both economies are exceptionally "open", exporting approximately three quarters of manufacturing output. Retaining this competitive advantage in export markets will be a critical objective of both economies.

The report also highlights a number of significant differences in the structure and performance of the two economies. In particular, the industrial component of the Northern economy is relatively small compared to the South; the aggregate performance of the Southern economy has been heavily influenced by a group of high-tech industries in which inward investment has been a dominant influence; and there is a group of mature indigenous industries in which significant differences are observed between Northern and Southern productivity, with the advantage being predominantly with Southern firms.

In conclusion, the report identifies shared competitive challenges. It also provides a clear basis for further comparative analysis of high productive sectors on the island which, if followed by collaborative actions, could improve the overall performance of the island economy.

AIDAN GOUGH

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EXECUTIVE SUMMARY

This report emphasises the strong economic performance of Northern Ireland and the exceptional performance of Ireland during the 1990s. Taken together the Island economy achieved an economic growth rate of 5.4 per cent per annum, the highest growth rate in the EU and the second highest in the Organisation for Economic Cooperation and Development(OECD). The report also emphasises the striking openness of both economies, the crucial importance of export competitiveness, and some stark differences in competitiveness, North and South.

The report is based on data drawn from the Southern Census of Industrial Production (CIP) and the Northern Annual Business Inquiry (ABI) which covers the period up to and including the year 2000. (Since the completion of this report new ABI data has been published for 2001, and some small revisions have been made to the data for 2000).

The report begins with a brief overview of trends in economic growth and structural change in Northern Ireland and Ireland since 1990. This highlights the more rapid growth and structural change in Ireland's economy during the 1990s, and the increase in the importance of the industrial sector as a source of wealth creation. Real Gross Domestic Product (GDP) in Ireland grew by an average of 7.2 per cent per year in 1990-2000, while real Gross National Product (GNP) grew by 6.3 per cent per year. For Northern Ireland during the 1990s, the pace of structural change was less dramatic although the overall level of growth in the region was significantly above that in the rest of the United Kingdom (UK) and European Union (EU). In Northern Ireland real GDP grew at 3.2 per cent per year in 1990-98, which compared favourably to the average annual growth rate of 2.1 per cent in the UK and 1.8 per cent in the EU during the same period. In general terms therefore, and by European standards, both economies grew rapidly during the 1990-2000 period.

Focusing on manufacturing industry, however, emphasises the marked differences in development in Northern Ireland and Ireland during the 1990s. In Ireland, the volume of manufacturing production grew at an exceptional rate of 13.8 per cent per annum in 1991-2001. In Northern Ireland, the manufacturing growth rate was a good deal lower at 1.9 per cent per annum in 1990-98, although this was still higher than the industrial growth rates of 1.1 per cent per year in the EU and 0.7 per cent per year in the UK in the 1990s. Important structural similarities do exist, however, in that both economies are exceptionally 'open' exporting about three-quarters of manufacturing output during the late 1990s. Both have also reduced their dependency on the (relatively slowly growing) UK market during the 1990s.

Although strongly influenced by the composition of manufacturing industry, and particularly the greater importance of high-tech sectors in Ireland, aggregate indicators derived from the ABI and CIP provide an overall perspective on the competitiveness of manufacturing industry, North and South:

- Average sales per employee in Northern Ireland manufacturing in 2000 amounted to €208,000/£127,000 compared to €385,000/£234,000 in Ireland.
- Average labour productivity (gross value added per employee) in the South (€138,000/£84,000) was more than double that in the North (€60,000/£37,000) in 2000.

- From 1998-2000 value added as a share of turnover was consistently higher in Ireland (34-36 per cent) than in Northern Ireland (29-33 per cent).
- In 1998-2000 the average wage and salary share of value added was higher in Northern Ireland (47-51 per cent) than in Ireland (18-24 per cent).

This type of analysis also emphasises some large disparities between different sectors - and in some sectors between plants - in Northern Ireland and Ireland. In some sectors these differences in productivity simply reflect the major influence of inward investment. In some other sectors, significant productivity differentials exist but have perhaps less obvious explanations.

Examining the productivity performance of individual manufacturing sectors over the 1998-2000 period allows them to be grouped into three broad categories:

- A group of mature industries, where inward investment has been limited, and productivity levels are broadly similar, North and South. This group includes textiles; wood and wood products; paper, pulp and paper products; rubber and plastics; basic metals; fabricated metal products; machinery and equipment; electrical machinery; motor vehicles and other transport equipment; and recycling.
- Another group of mature industries in which significant differences are observed between Northern and Southern productivity, with the advantage being predominantly with Southern firms. This group includes furniture; clothing; and non-metallic mineral products. Food, drink and tobacco also fall into this group but this may be due to differences in data definitions, North and South, rather than any real difference in productivity performance.
- High-tech industries where inward investment has been a dominant influence and levels of productivity appear significantly higher in Ireland than in Northern Ireland. This group includes printing and the production of recorded media (including software); chemicals and chemical products (including pharmaceuticals); office machinery and equipment; medical, precision and other instruments; and radio, television and communications equipment.

For this latter group of sectors the drivers of high productivity levels are fairly clear: high levels of capital investment, inward knowledge transfer - largely from the US, economies of scale resulting from serving a European or broader market, and a growing international market. More interesting is the question of how, in some mature sectors, notably clothing, furniture and non-metallic mineral products, Southern firms have been able to establish a productivity lead over their Northern counterparts. For these sectors, in particular, future more detailed comparisons could valuably be undertaken to identify the source of these productivity differences.

This analysis has established the feasibility of North/South comparisons based on the ABI and CIP, and the crucial importance of a sectoral or industry approach. It has also identified those sectors where productivity is similar and radically different, North and South.

INTRODUCTION

Despite their obvious connections there have been remarkably few studies comparing the economies of Northern Ireland and Ireland. In part, this reflects the 'region' status of Northern Ireland and the status of Ireland as a nation-state. It may also reflect the difficulty of making such comparisons given the different statistical systems which operate North and South.

In this report we aim to redress this deficit, by examining the structure of industry in the two economies and its competitive strengths and weaknesses. Our analysis is based largely on newly published data drawn from the CIP and the ABI (the successor to the Northern Annual Census of Production). The strength of both data sources is that they provide substantial detail on the production activities of firms, their cost structures and productivity. The disadvantage of both is that a considerable time-lag exists between the period to which the surveys relate and the publication of results. This means that the most recent data currently available for both areas relates to the year 2000¹.

Chapter 1 provides a brief overview of trends in the growth and structural change of Northern Ireland and Ireland since 1990. This highlights the much more rapid growth and structural change in Ireland's economy during the 1990s, and the dramatic increase in the importance of the industrial sector as a source of wealth. For Northern Ireland during the 1990s, the pace of structural change was less dramatic although the overall level of growth in the region was also significantly above that in the rest of the UK and EU.

Chapter 2, focussing on manufacturing industry, also emphasises the marked differences in development in Northern Ireland and Ireland during the 1990s. Important structural similarities do exist, however, in that both economies are exceptionally 'open' - exporting 74-78 per cent of manufacturing output during the late 1990s. Both have also reduced their dependency on the relatively slowly growing UK market during the 1990s.

Chapter 3 considers a number of key competitiveness indicators derived from the ABI and CIP. The aim of this chapter is to provide an overall perspective on the competitiveness of manufacturing industry, North and South. The analysis emphasises the marked disparities between different sectors - and in some sectors between plants - in Northern Ireland and Ireland. In some sectors these differences in productivity simply reflect inward investment; in some other sectors significant productivity differentials exist but have less obvious explanations.

Chapter 4 focuses in more detail on individual manufacturing sectors and compares their competitiveness, North and South. On the basis of their productivity performance over the 1998-2000 period, sectors are grouped into three broad categories and the comparative performance of each sector is discussed. Detailed data on each sector is included in Appendix 1.

The report concludes by emphasising the openness of both economies and therefore the importance of export competitiveness to the island economy.

¹ Although they have substantial similarities there are some methodological differences between the ABI and the CIP. For example, the ABI covers manufacturing companies with 20 or more employees, sampling those with fewer employees; whereas the CIP covers production companies with 3 or more employees. As such, ABI estimates are subject to greater variability in sectors where companies with lower employee numbers feature.

CHAPTER 1: ECONOMIC GROWTH AND DEVELOPMENT DURING THE 1990s - NORTH AND SOUTH

The past decade has been a time of exceptionally rapid economic growth in Ireland, both compared to the country's own previous experience and compared to most other countries in the 1990s. Real GDP grew by an average of 7.2 per cent per year in 1990-2000, while real GNP grew by 6.3 per cent per year.² In Northern Ireland, real GDP grew at a more moderate rate - 3.2 per cent per year in 1990-98 - but this compared favourably to the average annual growth rate of 2.1 per cent in the UK and 1.8 per cent in the EU during the same period.³ If we consider Ireland and Northern Ireland combined, the island economy had an economic growth rate of about 5.4 per cent per year in the 1990s - the highest growth rate in the EU and the second highest in the Organisation for Economic Cooperation and Development (OECD).

Similarly, rapid growth in employment was also evident in both regions during the 1990s. In Northern Ireland, total employment increased from 536,100 in 1990 to 650,600 in March 2002, a growth rate of 1.6 per cent per year.⁴ In Ireland, the total number in employment increased from 1,134,000 in 1990 to 1,745,500 in the first quarter of 2002, which was a growth rate of 3.7 per cent per year. This employment growth rate in Ireland was quite exceptional by almost any standards, while the rate of growth in the North was also relatively high compared to the average annual growth rate of 0.3 per cent in the UK or 0.9 per cent in the EU in 1990-2000.⁵ If we combine the figures for Northern Ireland and Ireland, total employment in the island economy grew by 3.1 per cent per year in 1990-2002 - the highest employment growth rate in the EU or OECD.

In both Ireland and Northern Ireland, however, this aggregate growth in output and employment has been very unevenly distributed across different sectors, with important implications for changing economic structure. In this chapter, as a prelude to the more detailed investigation of later sections, we briefly profile changes in the structure of output (GDP) and employment in the two economies over the decade to 2000.

² GDP is conventionally used in making international comparisons. However, in the case of Ireland GNP is generally regarded as more meaningful, since it excludes the substantial profits of foreign multinational companies that are withdrawn from the country.

³ UK and EU data from OECD, *Historical Statistics 1970-1999* (2000).

⁴ Recently revised data puts total employment in Northern Ireland at 660,300 at March 2002.

⁵ UK and EU data from OECD, *Labour Force Statistics 1980-2000* (2001).

Production by broad sector

In Ireland, there was relatively slow growth in agriculture, forestry and fishing, and in public administration and defence from 1990 to 2000. These sectors did record growth in output but their share of GDP declined (see Table 1). In contrast, there was a substantial increase in the share of GDP attributable to industry and other services. Distribution, transport and communication had a declining share of GDP in 1990 to 1995 but a rising share from 1995 to 2000.

Comparable data for Northern Ireland on the changing share of GDP in total regional value added, highlights a number of similarities in the development paths of the two economies (see Table 2):

- The broadly defined other services category increased in importance in terms of output in both the North and the South, and this sector accounted for much the same percentage of GDP in both jurisdictions at the end of the 1990s.
- The share of agriculture, forestry and fishing in Northern Ireland's GDP was already quite low in 1990 and it remained fairly stable in the 1990s, whereas this sector's share of GDP was declining from a higher level in Ireland. The outcome of these trends was that this sector's share of GDP stood at a similar level in both the North and the South by the end of the 1990s.
- The share of public administration and defence in GDP declined in Northern Ireland as it did in Ireland, but there was a major difference in the sense that it remained at a substantially higher level in the North at the end of the 1990s.

One crucial difference, however, relates to the diverging importance of industry as a source of wealth creation in the two economies: in the South, the contribution of industry (including construction) to GDP rose from 35.6 per cent to 42.8 per cent from 1990 to 2000; in the North the contribution of industry fell from 29.9 per cent in 1990 to 27.7 per cent in 1998.

TABLE 1:
PERCENTAGE COMPOSITION OF GDP AT FACTOR COST BY SECTOR,
IRELAND, 1990-2000

SECTOR	1990	1995	2000
Agriculture, forestry and fishing	9.7	8.1	4.0
Industry (including construction)	35.6	37.7	42.8
Distribution, transport and communication	19.4	15.5	16.4
Public administration and defence	5.6	4.9	3.4
Other services	33.8	38.1	38.1
Adjustment for financial services	-4.0	-4.7	-3.9
Statistical discrepancy	-	0.4	-0.9
TOTAL	100.0	100.0	100.0

SOURCE: Department of Finance, Economic Review and Outlook, 1996 and 2001, Table 4.

TABLE 2:
PERCENTAGE COMPOSITION OF GDP AT FACTOR COST BY SECTOR,
NORTHERN IRELAND, 1990-1998

SECTOR	1990	1995	1998
Agriculture, forestry and fishing	5.0	5.6	5.2
Industry (including construction)	29.9	28.8	27.7
Distribution, transport and communication	18.5	19.4	21.1
Public administration and defence	16.8	13.6	12.5
Other services	32.3	35.2	36.3
Adjustment for financial services	-2.6	-2.4	-2.9
TOTAL	100.0	100.0	100.0

SOURCE: Office of National Statistics - Northern Ireland Economic Research Centre (NIERC), Regional Economic Outlook.

Employment by broad sector

Agriculture, forestry and fishing, as well as public administration and defence, had declining shares of total employment in Ireland from 1990 to 2002, reflecting their share of aggregate GDP (Table 3).⁶ All of the other service sectors increased their share of employment in Ireland, although it is noticeable that there was little change in the percentage of employment in the predominantly public-sector category of education, health and welfare services. As regards the industrial sectors, Table 3 indicates that industry (excluding construction) had a declining share of total employment while the share of construction in employment increased. Taking account of the data in Tables 1 and 3 together, industry other than construction must have had relatively high and rapidly rising output per employee, so that its share of GDP increased while its share of employment declined.

Employment trends in Northern Ireland, as shown in Table 4, were quite similar in several respects. For example, agriculture, forestry and fishing, as well as public administration and defence, had a declining share of total employment. In addition, nearly all of the other service sectors increased their share of employment, with the major exception of the predominantly public-sector category of education, health and welfare services. Furthermore, industry (excluding construction) had a declining share of total employment, although the share of construction in employment showed little change.

Despite the similarities in employment trends, North and South, there remain significant differences in the composition of total employment. In particular, Northern Ireland has a substantially greater percentage of its employment in the two main public sector categories, namely, public administration and defence, and education, health and welfare services. These two categories combined account for 34.5 per cent of employment in Northern Ireland compared to 19.6 per cent in Ireland. All the other sectors, apart from wholesale and retail trade, account for higher percentages of employment in Ireland than in Northern Ireland.

⁶ Employment figures in Tables 3 and 4 are defined according to the EU General Industrial Classification of Economic Activities (NACE Rev. 1 system) in the South and the Standard Industrial Classification (SIC 92 system) in the North, but these are very similar in most respects and at this level of sectoral disaggregation are effectively the same. Data in the South is taken from a household survey which refers to persons with possible multiple jobs and that for the North is from an enterprise survey of employee jobs (which may double count the same person). Throughout the Tables figures for Northern Ireland relate to employee jobs and exclude those who are self-employed.

TABLE 3:
PERCENTAGE COMPOSITION OF EMPLOYMENT BY SECTOR,
IRELAND, 1990-2002

SECTOR	APRIL 1990	APRIL 1995	FIRST QUARTER 2002
Agriculture, forestry and fishing	14.9	11.5	7.0
Industry (excluding construction)	21.6	21.4	17.8
Construction	6.7	6.7	10.5
Wholesale and retail trade	13.7	13.4	14.3
Hotels and restaurants	4.2	5.2	6.2
Transport, storage and communication	6.0	6.1	6.2
Financial and other business services	9.3	10.6	13.0
Public administration and defence	5.6	5.8	4.7
Education, health and welfare services	14.4	15.6	14.9
Other services	3.4	3.8	5.4
TOTAL	100.0	100.0	100.0

SOURCE: For 1990 and 1995 - J.J. Sexton, G. Hughes and C. Finn, Occupational Employment Forecasts 2015, FÁS/ESRI manpower forecasting studies, report no. 10 (2002); for 2002 - CSO Quarterly National Household Survey, first quarter 2002 (2002).

TABLE 4:
PERCENTAGE COMPOSITION OF EMPLOYMENT BY SECTOR,
NORTHERN IRELAND, 1990-2002

SECTOR	JUNE 1990	JUNE 1995	MARCH 2002
Agriculture, forestry and fishing	3.3	3.0	2.2
Industry (excluding construction)	21.1	19.3	15.7
Construction	5.4	4.2	5.4
Wholesale and retail trade	14.2	15.3	17.0
Hotels and restaurants	3.7	4.7	5.9
Transport, storage and communication	4.1	3.8	4.1
Financial and other business services	7.4	7.9	10.5
Public administration and defence	10.7	10.5	9.2
Education, health and welfare services	25.7	26.9	25.3
Other services	4.5	4.6	4.6
TOTAL	100.0	100.0	100.0

SOURCE: DETI, Quarterly Employment Survey, Census of Employment.

CHAPTER 2: MANUFACTURING OUTPUT, EMPLOYMENT AND TRADE

Manufacturing industry is of particular importance since most international trade involves manufactured products. In Ireland, the volume of manufacturing production grew at a rate of 13.8 per cent per annum in 1991-2001. In Northern Ireland, the manufacturing growth rate was a good deal lower at 1.9 per cent per annum in 1990-98.⁷

Manufacturing growth and employment

By international standards, the manufacturing growth rate in Ireland was exceptionally high, while the growth rate in Northern Ireland was somewhat higher than the industrial growth rates of 1.1 per cent per year in the EU and 0.7 per cent per year in the UK in the 1990s.⁸ The general pattern in developed economies over the past decade or so has been that industry has grown relatively slowly so that its share of total GDP or value added has declined. The experience of Northern Ireland has been similar to this, although its industrial growth rate was a little higher than most, whereas Ireland has been exceptional in having such rapid industrial growth with industry's share of GDP increasing.

Total employment in manufacturing industry in Ireland was 196,900 in 1991 rising to 252,100 in 2001, a growth rate of 2.5 per cent per annum. In contrast manufacturing employment declined somewhat in the North, from 104,400 in 1990 to 97,200 in 2002, which was a decline of 0.6 per cent per annum. By comparison, industrial employment declined by 1.0 per cent per annum in the EU and by 1.6 per cent per annum in the UK in 1991-2001.⁹ Thus, the trend in Northern Ireland was again stronger than these international comparisons, while the growth in industrial employment in Ireland was exceptional.

It is also worth noting that the growth rate of industrial production per employee was broadly similar in Northern Ireland, the UK and the EU, at 2 to 3 per cent per year, while the rate in Ireland was exceptional at over 10 per cent per year. This high rate of growth of industrial production per employee in Ireland explains the trends noted above, whereby industry's share of GDP increased while its share of total employment declined. We comment further on some related features below.

Tables 5 and 6 illustrate data on the changing composition of manufacturing production in Ireland and Northern Ireland respectively. Table 5 on Ireland refers to gross output whereas Table 6 on the North refers to sales.¹⁰ It can be seen in Table 5 that three sectors accounted for rapidly growing proportions of manufacturing output in Ireland, namely, electrical and optical equipment; chemicals and chemical products; and paper products, publishing and printing.

⁷ The figure for Northern Ireland is the growth of real manufacturing GDP.

⁸ UK and EU data from OECD *Historical Statistics 1970-1999*.

⁹ UK and EU data from OECD, *Labour Force Statistics 1981-2001*.

¹⁰ The value of gross output and the value of sales are naturally very similar, since gross output measures the value of goods produced while sales measures the value of goods sold. The sectoral classification system used in Table 5 is NACE Rev. 1, which is much the same as the SIC 92 system used in Table 6. We do not include data for Northern Ireland at the start of the 1990s in Table 6, because the data available then was classified by sector according to the SIC 80 system, which is quite different to SIC 92 or NACE Rev. 1.

These three sectors combined accounted for 39 per cent of manufacturing gross output in 1991, rising to 71 per cent in 2000, while all other sectors had a declining share of output. The rapidly growing industries mainly produce high technology products such as computers and other electronic products, medical equipment and pharmaceuticals. Even in the paper products, publishing and printing sector, which might appear to be more traditional, the major growth area has been production of software which is included in that sector. Among the sectors that had a declining share of output, food, beverages and tobacco continued to account for a very substantial (although declining) share of output by 2000, whereas each of the remaining sectors had less than 3 per cent of output.

In Northern Ireland, as shown in Table 6, one sector accounted for a very rapidly growing proportion of sales, namely electrical and optical equipment, which was also one of the fastest growing sectors in the South. Apart from that, the other most noticeable changes in the North were declines in the proportion of sales coming from food, beverages and tobacco, and especially from textile products and leather products. Thus, the principal changes in the North were similar to the South in the sense that they involved relatively rapid growth in high technology sectors and relative decline in more traditional activities. But by the end of the 1990s, industrial production was rather more highly concentrated in the high-tech sectors in the South than in the North, at least when measured in terms of gross output or sales.

Tables 7 and 8 show the changing composition of manufacturing employment in Ireland and Northern Ireland. In the South, the principal changes were broadly similar to the changes seen in the composition of gross output in Table 5. Specifically, three sectors accounted for significantly increasing shares of manufacturing employment, namely, electrical and optical equipment; chemicals and chemical products; and paper products, publishing and printing. These three are the same ones that had rapidly increasing shares of gross output, but it is noticeable that their shares of employment were lower than their shares of output and also increased by much less than their shares of output. These three combined had a share of gross output rising from 39 per cent in 1991 to 71 per cent in 2000, while their combined share of employment increased from 33 per cent in 1991 to 45 per cent in 2000. Also, while all of the other sectors had declining shares of gross output, some of these sectors had slightly increasing or only marginally declining shares of employment. In relation to employment, these other sectors are still considerably more important than they appear in terms of gross output. Clearly, therefore, the three most rapidly growing sectors had relatively high and relatively rapidly-rising gross output per employee compared to the other sectors.

TABLE 5:
PERCENTAGE COMPOSITION OF MANUFACTURING GROSS OUTPUT BY SECTOR,
IRELAND, 1991-2000

SECTOR	1991	1995	2000
Food, beverages and tobacco	37.4	29.2	17.2
Textiles, textile products, leather and leather products	3.9	2.6	0.9
Wood and wood products	1.1	1.0	0.9
Paper, paper products, publishing and printing	7.9	9.1	10.8
Chemicals, chemical products	12.9	16.2	26.3
Rubber and plastic products	2.5	2.2	1.4
Non-metallic mineral products	2.8	2.1	1.6
Metals and metal products	4.2	3.0	2.2
Machinery and equipment n.e.c. ¹¹	3.5	3.2	1.8
Electrical and optical equipment	18.4	27.3	33.8
Transport equipment	1.9	1.6	1.2
Other manufacturing	3.7	2.7	1.9
TOTAL	100.0	100.0	100.0

SOURCE: Central Statistics Office (CSO), Census of Industrial Production.

TABLE 6:
PERCENTAGE COMPOSITION OF MANUFACTURING SALES BY SECTOR,
NORTHERN IRELAND, 1994/95-2000/01

SECTOR	1994/95	2000/01
Food, beverages and tobacco	33.5	29.6
Textiles, textile products, leather and leather products	13.3	7.6
Wood and wood products	3.1	3.3
Paper, paper products, publishing and printing	4.7	4.1
Chemicals, chemical products	6.9	4.4
Rubber and plastic products	5.0	5.2
Non-metallic mineral products	4.4	4.2
Metals and metal products	4.0	4.9
Machinery and equipment n.e.c.	7.5	5.8
Electrical and optical equipment	7.6	19.5
Transport equipment	8.3	8.4
Other manufacturing	1.6	3.1
TOTAL	100.0	100.0

SOURCE: NIERC, Exports and Sales Survey.

¹¹ Abbreviation for 'not elsewhere classified'.

TABLE 7:
PERCENTAGE COMPOSITION OF MANUFACTURING EMPLOYMENT BY SECTOR,
IRELAND, 1991-2000

SECTOR	1991	1995	2000
Food, beverages and tobacco	22.7	20.7	18.8
Textiles, textile products, leather and leather products	11.3	9.3	4.3
Wood and wood products	2.2	2.0	2.4
Paper, paper products, publishing and printing	8.5	9.1	9.3
Chemicals, chemical products	7.5	8.2	9.1
Rubber and plastic products	4.1	4.3	4.2
Non-metallic mineral products	5.1	4.3	4.4
Metals and metal products	6.5	5.8	6.6
Machinery and equipment n.e.c.	6.3	6.4	5.6
Electrical and optical equipment	16.5	20.8	27.0
Transport equipment	4.5	4.3	3.8
Other manufacturing	4.7	4.6	4.5
TOTAL	100.0	100.0	100.0

SOURCE: CSO, Census of Industrial Production.

TABLE 8:
PERCENTAGE COMPOSITION OF MANUFACTURING EMPLOYMENT BY SECTOR,
NORTHERN IRELAND, 1990-2002

SECTOR	1990	1995	2002
Food, beverages and tobacco	19.0	19.1	19.4
Textiles, textile products, leather and leather products	26.3	24.2	13.0
Wood and wood products	2.7	2.9	2.9
Paper, paper products, publishing and printing	5.6	6.1	6.4
Chemicals, chemical products	3.3	3.7	3.6
Rubber and plastic products	5.2	6.2	7.0
Non-metallic mineral products	4.0	3.9	5.7
Metals and metal products	4.9	5.1	7.2
Machinery and equipment n.e.c.	6.9	6.4	6.7
Electrical and optical equipment	7.5	8.6	11.1
Transport equipment	12.2	10.9	13.0
Other manufacturing	2.5	2.9	4.0
TOTAL	100.0	100.0	100.0

SOURCE: DETI, Quarterly Employment Survey, Census of Employment.

In Northern Ireland, as seen in Table 8, electrical and optical equipment, which had the fastest growth in share of sales, also had the most substantial increase in share of employment. But its share of employment was less than its share of sales and also increased by less than its share of sales. Thus, in this case too, this sector had relatively high and relatively rapidly-rising sales per employee compared to the other sectors. Apart from that, the other most significant change in the composition of manufacturing employment in the North was a substantial decline in the percentage of employment in textile products and leather products. Thus, in the North as in the South, there was a shift in manufacturing employment from more traditional sectors towards high-tech sectors. But by the end of the 1990s, this process of structural shift in industrial employment seemed to have gone somewhat further in the South.

Some of the observations mentioned above raise questions about the real economic significance of certain growth trends. This applies particularly to Ireland, where some prominent high-tech sectors have had very rapid growth of gross output, together with high and rising output per employee, and hence less remarkable growth in employment. It is well known that these sectors are largely foreign-owned, that they import most of their inputs, and that they withdraw very substantial profits from Ireland. They may also have an incentive, for tax reasons, to artificially inflate the value of their production recorded in Ireland. In the circumstances, one might reasonably ask how 'real' is the economic contribution of such industries? How much of the recorded value of the production of such industries is really retained in the domestic economy, accruing as income to Irish residents? It is not a simple matter to give a fully comprehensive answer to this type of question, but some useful indications are available.

For many years Forfás has carried out an annual survey of Irish economy expenditures, which has aimed to measure the value of expenditures by industries within Ireland's economy - on Irish wages and salaries, Irish services, and Irish-produced materials and components. During the 1990s, this survey found that foreign-owned industry in Ireland had Irish economy expenditures amounting to about 35 per cent of the value of its sales (with some variation between years). By comparison, Irish-owned industry (excluding the food industry) had Irish economy expenditures amounting to about 65 per cent of the value of its sales.¹² Clearly, therefore, a given amount of output from foreign-owned industry is worth much less to the Irish economy than an equivalent amount of output from Irish-owned industry. Nevertheless, the output of foreign-owned industry is by no means worthless for the economy of the South, since even 35 per cent of a very high value of sales can be a large amount.

¹² We exclude the food industry here because it has a distinctive and untypical structure of linkages with the Irish economy. Since the food sector is of little significance in foreign-owned industry while it is an important part of Irish-owned industry, excluding the food sector provides a more reasonable comparison between the two groups of industries.

Another way to look at this is that gross output per employee in foreign-owned industry was 2.3 times as high as gross output per employee in (non-food) Irish-owned industry in 1991, rising to 4.4 times as high in 1999. Given the figures above on Irish economy expenditures as a percentage of sales (and assuming that sales are about the same as gross output), we can estimate that Irish economy expenditures per employee were about 20 per cent higher in foreign-owned industry than in Irish-owned industry in 1991, rising to over 100 per cent higher in 1999. Thus, a given amount of employment in foreign-owned industry was worth more to the economy of Ireland than an equivalent amount of employment in Irish-owned industry, and that gap was rising over time.

It may be concluded that data on the output of the predominantly foreign-owned high-tech sectors certainly gives an exaggerated impression of the importance of such industries for Ireland's economy. At the same time, data on the employment of such industries has tended to give an understated impression of their relative importance. With this latter point in mind, it is genuinely significant that the predominantly foreign-owned high-tech sectors did have relatively rapid employment growth compared to other sectors. At the same time, total manufacturing employment in Ireland, in which these sectors formed an increasing component, had a relatively strong growth trend by international standards. These observations do not give an exaggerated impression of what was really happening.

Evidence on the importance of the externally-owned sector in the North is less comprehensive than that in the South, and suggests a somewhat different picture. Evidence on local linkages, for example, suggests that in contrast to the South, the overall level of local sourcing in the North by multinational enterprise (MNE) plants has fallen since the early 1980s. In 1983, 26 per cent of material purchases by MNE plants was made from within Northern Ireland compared to 19.7 per cent in 1998.¹³ In part this may reflect a decline in the propensity of UK-owned multinationals to source from within the UK. It may also reflect the changing structure of manufacturing in the North, however, with the contraction of traditional clusters noted earlier (e.g. textile-based industries, engineering, food). Cross-border sourcing by Northern based MNE plants has risen slightly since the early-1980s. In 1983, MNE plants in the North were sourcing 3.4 per cent of their inputs from the South, rising to 5 per cent in 1998.¹⁴

Recent studies which have examined knowledge transfers from MNEs to their suppliers have also noted a significant difference, North and South.¹⁵ In Northern Ireland, contacts between MNE plants and their suppliers were more frequent than in the South, but these contacts were typically of the more incidental kind, i.e. of the type normally associated with the supplier-buyer relationship. In the South, developmental links or partnerships between MNEs and their suppliers were more common. This may reflect the longer history of supplier-development-type initiatives in the South, as well as the development of the clusters of high-tech industry noted earlier.

¹³ Northern Ireland Economic Council (NIEC), *Economic Strategy: Industrial Development Linkages* (1986), p.27; NIEC, *Let's Get Together. Linkages and Inward Investment in Northern Ireland* (1999), p.40.

¹⁴ *Ibid.*

¹⁵ N. Hewitt-Dundas et al., *Learning from the Best: Knowledge Transfers from Multinational Plants in Ireland - A North/South Comparison* (2002).

Although foreign-owned industry in Ireland grew considerably faster than Irish-owned industry, this does not mean that Irish-owned industry had poor growth by most standards. In the period 1991–2000, the average annual rate of employment growth was 3.9 per cent in foreign-owned manufacturing, 2.9 per cent in total manufacturing in Ireland, and 2.1 per cent in Irish-owned manufacturing.¹⁶ At the same time, manufacturing employment was declining in the UK and the EU generally. There is no official data on trends in the volume of production of Irish-owned industry, as distinct from foreign-owned industry. However, it has been estimated that in 1987–95 the volume of production in Irish-owned manufacturing increased by 4.0 per cent per year. This was well below the rate of 9.9 per cent for total manufacturing in Ireland, but it was above the rates of 2.0 per cent in the OECD and 1.7 per cent in the EU.¹⁷

Export Orientation

Tables 9 and 10 show data on the export-orientation of industries in Ireland and Northern Ireland. The data on Northern Ireland in Table 10 refer to 'external sales', meaning all sales outside Northern Ireland including sales to Great Britain. It can be seen that total manufacturing is highly export-oriented in both the North and the South, with about three-quarters of output being sold externally according to the latest figures. In the South these figures have been rising steadily while there is a less clear trend in the North.

In Ireland, three sectors are particularly highly export-oriented, namely chemicals and chemical products; electrical and optical equipment; and paper products, publishing and printing. As was discussed above, these sectors have been characterised by particularly rapid growth of output and a good deal of foreign ownership in the production of high-tech products. The growth of these three highly export-oriented sectors was the major influence in bringing about the marked increase in the export-orientation of total manufacturing in Ireland. Among the remaining sectors, less than half of them exported a rising proportion of their output in the 1990s. Nevertheless, nearly all sectors were exporting about half or more of their output at the end of the period, the main exceptions being non-metallic mineral products and wood and wood products, which mainly produce goods of low value relative to their weight.

A feature of the trends in Ireland was that foreign-owned industry exported a very high and rising proportion of its output – 86 per cent in 1991 rising to 91.7 per cent by 2000. Meanwhile, Irish-owned industry had exported 26.6 per cent of its output in 1986, and this had risen to 34.8 per cent in 1991 and 35.9 per cent in 1995, but there was no significant further increase – in fact the figure slipped to 33.2 per cent in 2000.¹⁸ This could suggest that indigenous industry in the South was losing competitiveness in export markets to some extent in the late 1990s, although this was not necessarily the case. Another possibility is that indigenous exports were able to compete quite successfully, but that domestic sales were increasing more rapidly than exports because the domestic economy was growing so much faster than most other economies. It is also possible that the sectoral composition of indigenous industry was working against a rise in its overall export orientation; this could occur if sectors that were relatively highly export-oriented to begin with were faced with relatively slow growth in international demand, for example the food sector.

¹⁶ CSO, *Census of Industrial Production* (2001).

¹⁷ Eoin O'Malley, 'The Revival of Irish Indigenous Industry 1987-1997', in T.J. Baker, David Duffy and Fergal Shortall (eds), *ESRI Quarterly Economic Commentary* (April 1998).

¹⁸ These figures are derived from the annual CSO Census of Industrial Production.

In Northern Ireland, most of the individual sectors were more highly export-oriented than their counterparts in Ireland, as can be seen in Tables 9 and 10. As many as half of the sectors in the North were selling more than three-quarters of their output outside Northern Ireland at the end of the period, whereas just a quarter of the sectors in Ireland were exporting over three-quarters of their output. This may, in part, reflect the relatively small size of the Northern Ireland market but also the traditionally strong orientation of many Northern Ireland firms towards the UK national market.

Tables 11 and 12 show the percentage of manufacturing exports or external sales going to each principal destination, from Ireland and Northern Ireland. In the case of Ireland, there was a noticeable decline in the percentage of total manufacturing exports that went to the UK in the 1990s, from 27.1 per cent to 19.0 per cent. This represented the continuation of a longer-term trend that had been going on for several decades. In the 1970s and 1980s, the decline in the proportion of Southern exports going to the UK mainly reflected a rise in the proportion going to the rest of the EU. This continued to some extent in the 1990s, as seen in Table 11, while there was also a rise in the proportion going to non-EU countries, essentially reflecting the growing importance of the USA as a destination for Southern exports.

To a great extent, these trends were brought about by foreign-owned industries, which came to account for three-quarters of Ireland's manufacturing exports by 1991, rising further in the 1990s. Many of the foreign MNEs arriving in Ireland were aiming to produce primarily for the EU market as a whole; many of them had no special focus on the UK, whereas Irish exporters had traditionally been highly focused on the UK. Therefore, as the exports of foreign MNEs grew, the proportion of total exports going to the UK declined while the proportion going to the rest of the EU rose. In the 1990s also, it was foreign MNEs, much more than indigenous firms, that began to export increasingly to non-EU markets. As a consequence of these trends, it can be seen in Table 11 that the predominantly foreign-owned high-tech sectors had about the lowest proportion of their exports going to the UK.

Foreign-owned industry in Ireland sent just 22 per cent of its exports to the UK in 1991, declining somewhat to 17 per cent in 2000. At the same time Irish-owned industry sent as much as 42 per cent of its exports to the UK in 1991, with only a small decline to 40 per cent in 2000.¹⁹ Clearly indigenous industry remained much more reliant on the nearest neighbouring market.

¹⁹ These figures are derived from the annual Census of Industrial Production.

The nearest neighbouring market also seems to be an influence that has brought about different export patterns among Irish-owned firms in different regions. Thus, indigenous industry in the Border, Midland and Western (BMW) region exported 38.1 per cent of its output in 2000, which was considerably higher than the figure of 31.4 per cent for indigenous industry in the rest of Ireland. Compared to Irish-owned industry in the rest of the country, indigenous industry in the BMW region also sent a greater proportion of its exports to the UK - 44.2 per cent compared to 38.3 per cent. Consequently, indigenous industry in the BMW region sold 16.8 per cent of its total output in the UK compared to just 12.0 per cent for indigenous industry located elsewhere. Unfortunately this data, from the CIP, does not distinguish Northern Ireland as an export destination separate from the UK, but it seems very likely that the figures mentioned above reflect a tendency for firms that are located closer to Northern Ireland to export more to Northern Ireland.

Although the UK, including Northern Ireland, has been receiving a declining proportion of total exports from Ireland, this has been largely caused by the growth of exports from foreign MNEs in Ireland. The UK, including Northern Ireland, remains an important export market for indigenous industry in Ireland, and particularly for indigenous industry that is located relatively close to Northern Ireland.

In Table 12 it can be seen that almost half of Northern Ireland's external sales go to Great Britain, which is a good deal higher than the proportion of Ireland's exports that go to the UK. However, the percentage of the North's external sales going to Great Britain has also declined quite significantly in the 1990s. This decline was quite pervasive since it occurred in three-quarters of the individual sectors.

Outside the UK, Ireland remains Northern Ireland's most important 'export' market. Data from the NIERC exports survey suggests that in 2000/01 exports sales from Northern Ireland to Ireland amounted to £619m - markedly greater than Northern Ireland's exports to the USA (£548m) and to the whole of Asia (£405m).

TABLE 9:
EXPORTS AS A PERCENTAGE OF GROSS OUTPUT,
IRELAND, 1991-2000

SECTOR	1991	1995	2000
Food, beverages and tobacco	45.4	50.9	53.8
Textiles, textile products, leather and leather products	66.5	72.4	66.2
Wood and wood products	25.6	30.7	26.3
Paper, paper products, publishing and printing	54.1	65.2	81.4
Chemicals, chemical products	84.9	90.6	96.3
Rubber and plastic products	58.0	59.5	46.6
Non-metallic mineral products	30.1	25.3	23.7
Metals and fabricated metal products	57.5	56.0	46.1
Machinery and equipment n.e.c.	75.4	76.7	71.6
Electrical and optical equipment	93.0	89.8	88.2
Transport equipment	48.3	63.9	70.5
Other manufacturing	50.6	55.4	43.5
TOTAL MANUFACTURING	62.2	70.5	79.0

SOURCE: CSO, Census of Industrial Production

TABLE 10:
EXTERNAL SALES AS A PERCENTAGE OF TOTAL SALES,
NORTHERN IRELAND, 1990/91-2000/01

SECTOR	1990/91	1994/95	2000/01
Food, beverages and tobacco	54.4	53.3	65.9
Textiles, textile products, leather and leather products	90.0	91.0	90.3
Wood and wood products	20.7	31.1	38.3
Paper, paper products, publishing and printing	40.4	38.3	42.4
Chemicals, chemical products	80.4	42.7	80.0
Rubber and plastic products	n.a.	80.2	77.3
Non-metallic mineral products	25.4	26.5	36.6
Metals and fabricated metal products	64.3	74.9	49.0
Machinery and equipment n.e.c.	66.8	88.3	86.6
Electrical and optical equipment	93.0	86.7	93.1
Transport equipment	96.2	95.4	91.2
Other manufacturing	n.a.	42.6	58.4
TOTAL MANUFACTURING	70.7	66.5	73.4

SOURCE: NIERC, Exports and Sales Survey.

Note: Data for 1994/95 and 2000/01 is classified according to SIC 92, while the 1990/91 data is classified according to SIC 80. Thus, the sectoral definitions in 1990/91 may not correspond exactly to those in the later years.

TABLE 11:
PERCENTAGE OF EXPORTS GOING TO EACH MAJOR DESTINATION,
IRELAND, 1991-2000

SECTOR	1991			2000		
	UK	OTHER EU	ELSEWHERE	UK	OTHER EU	ELSEWHERE
Food, beverages and tobacco	35.0	31.6	33.4	31.7	43.6	24.7
Textiles, textile products, leather and leather products	55.3	33.4	11.2	38.2	45.0	16.7
Wood and wood products	74.2	19.9	5.8	65.1	24.1	10.9
Paper, paper products, publishing and printing	28.2	61.7	10.1	20.8	66.3	12.9
Chemicals, chemical products	14.3	54.3	31.4	8.3	52.5	39.2
Rubber and plastic products	34.5	58.3	7.1	47.6	44.5	8.0
Non-metallic mineral products	34.0	20.5	45.5	32.0	30.9	37.1
Metals and fabricated metal products	43.8	41.4	14.8	39.5	40.9	19.5
Machinery and equipment n.e.c.	26.8	50.3	22.8	23.4	47.2	29.5
Electrical and optical equipment	20.4	54.7	24.9	21.4	47.1	31.5
Transport equipment	19.0	32.2	48.8	10.0	65.8	24.2
Other manufacturing	21.3	32.9	45.8	27.6	35.0	37.4
TOTAL MANUFACTURING	27.1	45.7	27.2	19.0	50.4	30.6

SOURCE: CSO, Census of Industrial Production.

TABLE 12:
PERCENTAGE OF EXTERNAL SALES GOING TO GREAT BRITAIN AND ELSEWHERE,
NORTHERN IRELAND, 1990/91-2000/01

SECTOR	1990/91		2000/01	
	GREAT BRITAIN	ELSEWHERE	GREAT BRITAIN	ELSEWHERE
Food, beverages and tobacco	41.9	58.1	69.4	30.6
Textiles, textile products, leather and leather products	80.0	20.0	71.9	28.1
Wood and wood products	61.7	38.3	30.4	69.6
Paper, paper products, publishing and printing	49.5	50.5	44.2	55.8
Chemicals, chemical products	20.4	79.6	18.7	81.3
Rubber and plastic products	46.4*	53.6*	38.6	61.4
Non-metallic mineral products	48.6	51.4	41.7	58.3
Metals and fabricated metal products	25.3	74.7	23.5	76.5
Machinery and equipment n.e.c.	33.6	66.4	37.5	62.5
Electrical and optical equipment	34.7*	65.3*	40.4	59.6
Transport equipment	51.4	48.6	27.6	72.4
Other manufacturing	60.0*	40.0*	43.2	56.8
TOTAL MANUFACTURING	54.5	45.5	47.8	52.2

SOURCE: NIERC, Exports and Sales Survey Note: Figures marked with an asterisk refer to 1994/95

CHAPTER 3: MANUFACTURING COMPETITIVENESS - NORTH AND SOUTH

Introduction

In this chapter we provide an overview of the competitiveness of manufacturing, North and South. Comparisons for individual sectors are the focus of Chapter 4. Key indicators used in this chapter are:

- **Turnover or sales per employee** which gives an indication of firms' total ability to generate sales per person employed. This is a useful general indicator of productivity but may reflect not only sales of a firm's own products but also sales of goods sold, but not manufactured, by the firm.
- **Gross Value Added (GVA) per employee** is the primary indicator of labour productivity. It measures the capability of firms to generate wealth on a comparable per employee basis.²⁰
- **Wages and salaries as a percentage of GVA** is an indicator of labour's share of the wealth created by each business. The remainder of value added not accounted for by wages and salaries includes employment taxes and returns on capital employed by the firm.
- **Value added as a percentage of turnover** is an indicator of the proportion of firms' sales which represent added value as opposed to purchases of materials or services. Moves up the value chain, for example by basic food producers, would increase the proportion of value added in sales as product quality increased.

In each case the tables in this chapter are in real terms, measuring values in €000 at year 2000 prices. We also focus the commentary on average values for the 1998-2000 period to even out any year-specific irregularities in the data. Figures for individual years are given in the tables, however, to reflect productivity dynamics within the 1998-2000 period.

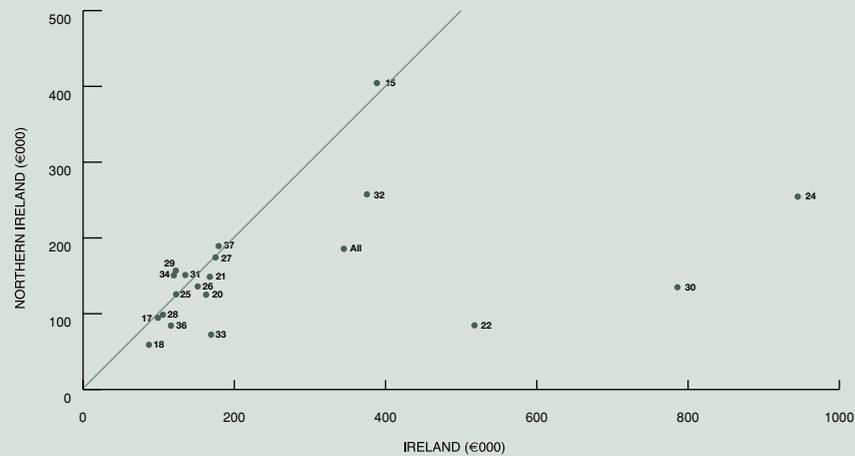
Sales per Employee

Average sales per employee in Northern Ireland manufacturing in 2000 was €208,000/£127,000 compared to €385,000/£234,000 in Ireland (Table 13). This aggregate comparison, however, is strongly influenced by a small group of Southern industries with very high levels of turnover per employee. Key among these are chemicals and chemical products (NACE 24); and office machinery and equipment (NACE 30) both of which have sales per employee more than twice the Southern average and more than four times the average for Northern manufacturing firms.

²⁰ One difference exists between the way this measure is constructed in the Northern ABI and the Southern CIP in terms of the point in time at which employment is measured. In the ABI this is December in the CIP September. This could contribute to differences in per head figures particularly at the sectoral level or where sectors have a more seasonal pattern of activity. It may also be worth pointing out that in the UK official statistics terminology GVA per head figures from the ABI are referred to as 'approximate GVA'. This is to differentiate them from the similar Regional Accounts measures.

More valuable comparisons are made on a sector-by-sector basis and Figure 1 provides a graphical summary of the individual sectoral figures reported in Table 13. In Figure 1 each point represents a sector with its position determined by the average sales per employee, North and South, over the 1998-2000 period. In other words, points (i.e. sectors) on the 45 degree line had similar sales per employee, North and South, over this period. Sectors above and to the left of the 45 degree line had higher sales per employee in the North than in the South and those to the right and below the line had higher sales per employee in the South. What is immediately obvious is a strong clustering of sectors around the 45 degree line with turnover per employee in the €80-€200,000/£48-£121,000 range with the food sector also close to the 45 degree line at a much higher level of sales per employee (around €400,000/£244,000 per annum). For these sectors the implication is that sales per employee were broadly similar, North and South, a very different picture to the four sectors (publishing, printing and recorded media; chemicals; office machinery and equipment; radio, television etc.) in which Southern sales per employee were well in excess of that in the North. As indicated earlier, these sectors are also those which have experienced most inward investment over the last decade and have the strongest export orientation.

FIGURE 1:
REAL SALES PER EMPLOYEE BY SECTOR, 1998-2000



Note: see page 62 for NACE code references

TABLE 13:
REAL SALES PER EMPLOYEE FOR NORTHERN IRELAND AND IRELAND INDUSTRIES:
1998-2000, IN CONSTANT YEAR 2000

SECTOR	IRELAND			NORTHERN IRELAND		
	1998	1999	2000	1998	1999	2000
Food, drink, tobacco	374.6	392.1	398.9	298.3	420.8	494.1
Textiles	105.9	97.4	93.6	98.7	95.6	89.4
Wearing apparel	74.4	95.8	91.1	56.0	62.5	58.6
Wood and wood products	172.0	168.1	147.6	120.6	106.0	148.6
Pulp, paper and paper products	169.4	167.4	166.1	142.7	150.5	153.0
Publishing, printing, recorded media	525.7	527.0	500.2	80.8	83.7	89.6
Chemicals and chemical products	821.0	943.8	1070.1	225.3	286.6	251.6
Rubber and plastic products	123.2	123.7	122.2	119.7	127.3	129.8
Other non-metallic mineral products	148.7	149.9	156.1	125.7	151.4	130.8
Basic metals	183.7	176.4	165.5	166.9	205.2	150.8
Fabricated metal products	104.8	105.5	106.5	95.4	96.0	104.5
Machinery and equipment nec	126.6	117.0	124.3	149.4	149.1	171.9
Office machinery and equipment	658.3	723.3	976.1	129.8	138.5	136.3
Electrical machinery nec	117.2	122.2	166.2	138.0	156.3	159.0
Radio, television and communications	354.3	371.0	400.5	178.0	211.2	383.2
Medical, precision and instruments	147.5	162.6	197.7	63.2	70.0	83.9
Motor vehicles, other transport	111.2	111.6	137.3	156.5	160.4	135.3
Furniture, manufacture nec	109.7	114.3	124.5	84.4	82.8	85.8
Recycling	164.9	158.5	214.5	178.1	163.1	226.6
All manufacturing (€)	304.3	344.9	385.2	160.7	188.8	207.6
All manufacturing (£)	185.3	210.0	234.5	97.8	114.9	126.4

Labour productivity (GVA per employee)

Labour productivity is generally recognised as one of the key indicators of industrial competitiveness and Table 14 provides an overview by sector. As with turnover per employee, average labour productivity in the South (€138,000/£84,000) was more than double that in the North (€60,000/£37,000) in 2000. Also like turnover per employee, however, value added per employee differs strongly between sectors and, in the South, the aggregate figure is influenced strongly by particularly high levels of productivity in a small group of high-tech sectors. In chemicals and chemical products (which includes pharmaceuticals) in particular, GVA per employee was almost four times the Southern manufacturing average in 2000.

Figure 2 illustrates the comparison of average labour productivity North and South over the 1998-2000 period. Again, some clustering around the 45 degree line is evident, suggesting that in a number of sectors manufacturing productivity is broadly similar, North and South. As with turnover per employee, however, Southern productivity is very much higher in a group of inward investment dominated sectors. It is worth noting here that in the case of predominantly foreign-owned companies, activities that are carried out within the multinational enterprise but outside Ireland - such as research and development or marketing - can contribute significantly towards raising the value of products that are produced in the Irish branch of the enterprise. If the Irish branch is not fully charged for the cost of such external activities, this will artificially raise its recorded value added or productivity. Even if the Irish branch is fully charged for such costs, the result can still be a level of turnover or sales per Irish employee that looks surprisingly high. In addition, there can be an incentive for tax reasons for foreign-owned firms to maximise the proportion of their profits that is recorded in Ireland. To achieve this they can supply inputs to the Irish branch from other parts of the firm at relatively low prices, or they can sell products from the Irish branch to other parts of the firm at relatively high prices. To the extent that this is done (a practice known as transfer-pricing), it would tend to artificially raise the recorded level of value added or turnover per employee in the Irish branch.



Comparing average labour productivity over the 1998-2000 period suggests four sectors in which Northern productivity was more than 10 per cent higher than that in the South. The margin was greatest (39 per cent) in motor vehicles and other transport equipment (NACE 34), which in the North is a sector dominated by Bombardier-Shorts. Second, with average productivity 19 per cent above that in the South was the small (i.e. less than 1,000 employees) recycling sector (NACE 37), followed by basic metals (NACE 27) and fabricated metal products (NACE 28), both with a 10 per cent lead.

Of the remaining 15 sectors distinguished in our analysis, four had average productivity which differed by less than 10 per cent, North and South, and eleven sectors had productivity more than 10 per cent higher in the South. The four sectors in which productivity differed by less than 10 per cent were: rubber and plastics products (NACE 25); textiles (NACE 17); machinery and equipment nec (NACE 29); and pulp, paper and paper products (NACE 21).

The 11 sectors in Ireland whose productivity was more than 10 per cent above the same Northern Ireland sector include the group of high-tech sectors dominated by inward investment businesses. They also include, however, a group of mature industries which have established a significant productivity lead over their Northern Ireland counterparts. For example, productivity in non-metallic minerals in Ireland was 16 per cent higher than that in Northern Ireland, while food, furniture and clothing all had productivity levels in Ireland more than 25 per cent higher than that in the North.

TABLE 14:
REAL GVA PER EMPLOYEE FOR NORTHERN IRELAND AND IRELAND INDUSTRIES:
1998-2000 IN CONSTANT YEAR 2000

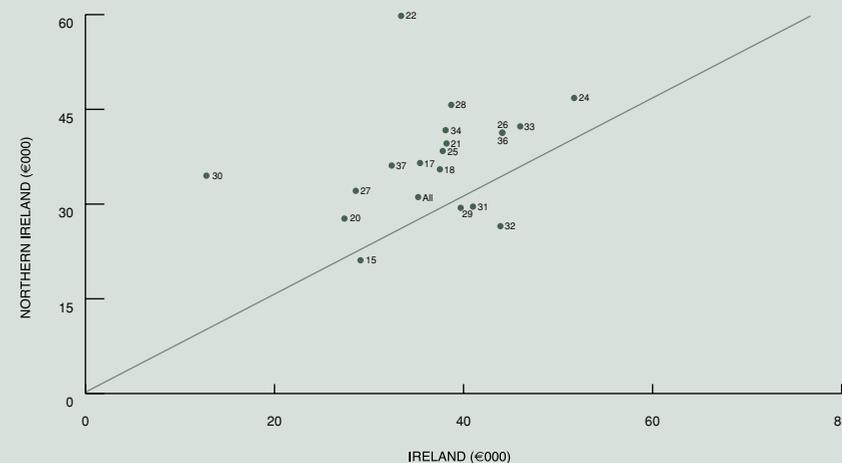
SECTOR	IRELAND			NORTHERN IRELAND		
	1998	1999	2000	1998	1999	2000
Food, drink, tobacco	103.4	113.9	121.5	69.8	81.7	101.2
Textiles	36.7	35.0	33.4	36.5	35.6	31.6
Wearing apparel	30.0	34.9	32.5	24.4	26.4	12.1
Wood and wood products	44.4	49.8	39.8	31.2	28.2	45.5
Pulp, paper and paper products	63.7	66.9	61.2	54.5	60.6	62.1
Publishing, printing, recorded media	142.7	180.4	194.2	53.4	49.3	48.6
Chemicals and chemical products	427.4	502.0	533.3	108.2	130.5	118.3
Rubber and plastic products	47.9	46.7	45.0	48.2	46.4	50.1
Other non-metallic mineral products	63.6	67.1	69.9	56.3	58.2	53.1
Basic metals	51.5	49.4	49.0	69.1	53.7	43.4
Fabricated metal products	39.9	39.7	43.3	43.2	43.3	48.9
Machinery and equipment nec	50.0	47.0	49.0	45.2	41.5	51.8
Office machinery and equipment	81.7	94.4	125.2	51.8	57.9	66.6
Electrical machinery nec	48.1	46.2	73.5	41.1	41.4	51.7
Radio, television and communications	127.6	176.9	192.0	39.6	60.3	109.9
Medical, precision and instruments	61.7	72.5	101.6	20.6	33.1	39.5
Motor vehicles, other transport	40.5	42.0	55.2	64.2	83.0	43.8
Furniture, manufacture nec	44.4	46.6	63.5	36.7	34.8	32.8
Recycling	47.7	57.2	69.3	54.6	58.2	94.9
All manufacturing (€)	103.4	122.7	138.2	53.3	58.8	60.0
All manufacturing (£)	62.9	74.7	84.1	32.4	35.8	36.5

Value Added as a Percentage of Sales

Value added as a percentage of sales provides an indication of the market positioning of a sector: the higher the value added share the more wealth the company is generating per € of sales. This wealth may represent returns to labour (e.g. wages and salaries) or may represent the returns necessary to encourage investment in capital and/or research and development and innovation. In general terms the expectation would be that the value added share of sales would be lowest in basic process industries, such as basic food processing and highest in craft, capital intensive or knowledge intensive sectors.

From 1998-2000 value added as a share of turnover was consistently higher in Ireland (at 34-36 per cent) than in Northern Ireland (29-33 per cent) (Table 15). Perhaps more worrying from a Northern perspective is that the North-South gap between value added shares widened over the 1998-2000 period from 0.8 percentage points to around 7 percentage points.

FIGURE 3:
GVA AS PERCENTAGE OF SALES BY SECTOR, 1998-2000



Note: see page 62 for NACE code references

Like turnover per employee and productivity, the value added share of sales also differs markedly between sectors, and again Figure 3 suggests the North/South comparison for the average value added share over the 1998-2000 period. The key points are:

- There is no clear and systematic relationship between the share of value added in turnover and the level of turnover per employee. Some high turnover per employee sectors have relatively low value added shares (food, office machinery and equipment), while others have high value added shares (chemicals).
- In five sectors the value added share was more than 10 per cent higher in the South: radio, television and communications (NACE 32); electrical machinery nes (NACE 31); food, drink and tobacco (NACE 15); machinery and equipment nes (NACE 29); and chemicals and chemical products (NACE 24).
- In five sectors the value added share was more than 10 per cent higher in the North: recycling (NACE 37); basic metals (NACE 27); fabricated metal products (NACE 28); publishing, printing and manufacture of recorded media (NACE 22); and office machinery (NACE 30).
- In the nine other sectors the value added share differed by less than 10 per cent North and South. These sectors included a mix of both mature sectors (e.g. clothing, textiles) and more high-tech sectors (e.g. medical and precision instruments).

TABLE 15:
VALUE ADDED AS A PERCENTAGE OF TURNOVER FOR NORTHERN IRELAND AND IRELAND INDUSTRIES, 1998-2000

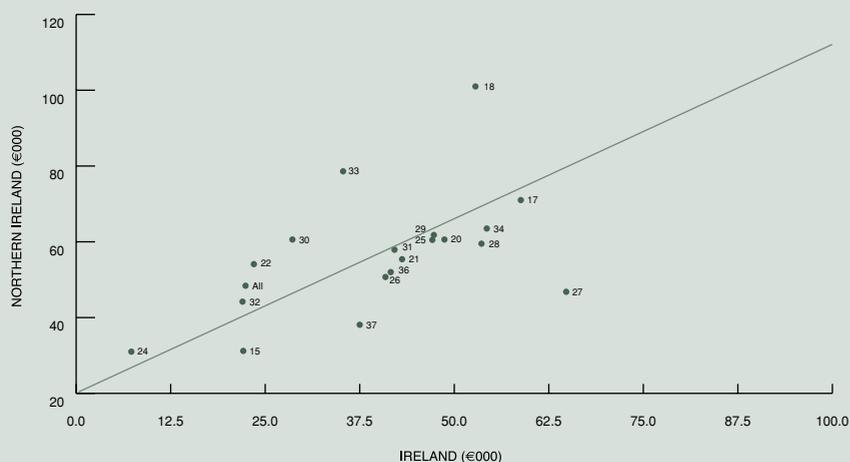
SECTOR	IRELAND			NORTHERN IRELAND		
	1998	1999	2000	1998	1999	2000
Food, drink, tobacco	27.6	29.1	30.5	23.4	19.4	20.5
Textiles	34.6	35.9	35.7	37.0	37.2	35.3
Wearing apparel	40.4	36.4	35.7	43.7	42.2	20.6
Wood and wood products	25.8	29.6	26.9	25.9	26.6	30.6
Pulp, paper and paper products	37.6	40.0	36.9	38.2	40.2	40.5
Publishing, printing, recorded media	27.2	34.2	38.8	66.1	58.9	54.3
Chemicals and chemical products	52.1	53.2	49.8	48.0	45.5	47.0
Rubber and plastic products	38.9	37.8	36.8	40.2	36.5	38.6
Other non-metallic mineral products	42.7	44.8	44.8	44.8	38.4	40.6
Basic metals	28.1	28.0	29.6	41.4	26.2	28.8
Fabricated metal products	38.0	37.6	40.6	45.3	45.1	46.8
Machinery and equipment nec	39.5	40.2	39.4	30.2	27.8	30.1
Office machinery and equipment	12.4	13.1	12.8	40.0	41.8	48.8
Electrical machinery nec	41.0	37.8	44.2	29.8	26.5	32.5
Radio, television and communications	36.0	47.7	47.9	22.3	28.6	28.7
Medical, precision and instruments	41.9	44.6	51.4	32.6	47.3	47.1
Motor vehicles, other transport	36.4	37.7	40.2	41.0	51.7	32.4
Furniture, manufacture nec	40.5	40.7	51.0	43.5	42.1	38.3
Recycling	28.9	36.1	32.3	30.7	35.7	41.9
All manufacturing	34.0	35.6	35.9	33.2	31.2	28.9

Labour share of value added

This provides an indication of labour’s share of the wealth generated by business. High labour shares imply low levels of profitability and/or low returns to physical and intellectual capital. In this sense it might be argued that high labour shares will tend to characterise less knowledge-intensive businesses, particularly where the firm’s research and development is being conducted outside the island. From an economic development point of view, however, a high labour share may be desirable as labour income will tend to be ‘retained’ within the region whereas returns to capital or knowledge - in the case of externally-owned industries - might easily flow abroad as remitted profits or through transfer-pricing arrangements.

As shown in Table 16, there are much higher average wage and salary shares of value added in Northern Ireland (47-51 per cent) than in Ireland (18-24 per cent). Again significant sectoral variation exists but for this variable a more consistent North/South pattern is evident with the labour share higher in Northern Ireland in all but one sector (manufacture of basic metals, NACE 27 - see Figure 4).

FIGURE 4:
WAGES AND SALARIES AS A PERCENTAGE OF VALUE ADDED BY SECTOR, 1998-2000



Note: see page 62 for NACE code references

Although faster wage inflation and strengthening Euro may have changed the situation since 2000, it is also notable that in absolute terms from 1998-2000 wages and salaries per employee were also higher in Northern Ireland than in Ireland in the majority of sectors.²¹ One unsurprising exception – given relative shares of labour costs in value added - is the manufacture of basic metals. Other sectors where absolute earnings per employee were higher in the South were: publishing and recorded media; radio, TV and communications equipment; furniture manufacture; and other manufacturing.

²¹ We are grateful to Michael Anyadike-Danes for highlighting this point.

TABLE 16:
WAGES AND SALARIES AS A PERCENTAGE OF GVA FOR
NORTHERN IRELAND AND IRELAND INDUSTRIES, 1998-2000

SECTOR	IRELAND			NORTHERN IRELAND		
	1998	1999	2000	1998	1999	2000
Food, drink, tobacco	22.7	21.5	20.5	35.2	31.7	26.8
Textiles	58.6	58.9	59.4	64.0	67.9	81.0
Wearing apparel	51.9	53.6	51.3	70.2	72.2	160.5
Wood and wood products	50.9	46.5	51.5	67.7	64.8	49.3
Pulp, paper and paper products	44.0	42.2	46.0	57.5	53.0	55.6
Publishing, printing, recorded media	27.4	19.6	14.6	47.9	53.2	61.2
Chemicals and chemical products	7.7	6.9	6.0	35.0	27.3	30.7
Rubber and plastic products	46.2	48.0	47.8	61.6	62.0	57.9
Other non-metallic mineral products	43.3	38.4	37.9	50.5	53.2	48.5
Basic metals	58.9	70.6	57.7	32.5	51.7	56.3
Fabricated metal products	52.0	55.1	50.4	59.9	61.9	56.8
Machinery and equipment nec	46.0	48.5	48.8	60.4	65.4	59.7
Office machinery and equipment	33.5	23.7	20.0	55.8	60.7	65.4
Electrical machinery nec	40.3	43.8	31.2	55.2	61.2	57.3
Radio, television and communications	30.2	13.7	14.1	66.9	40.9	24.8
Medical, precision and instruments	38.0	32.6	24.0	92.4	71.5	72.0
Motor vehicles, other transport	53.2	55.4	52.2	55.9	43.9	90.7
Furniture, manufacture nec	42.0	41.2	32.5	49.5	54.3	52.2
Recycling	36.4	38.5	31.3	43.6	33.1	37.7
All manufacturing	24.3	20.5	18.2	51.0	46.8	47.5

CHAPTER 4: INDUSTRY COMPETITIVENESS - NORTH AND SOUTH

Introduction

In this chapter we compare productivity in individual manufacturing sectors, North and South. The comparisons are reported graphically in Appendix 1.

The comparisons made in this chapter are based on data from the ABI and the CIP. In each case data is available on comparable SIC92/NACE Rev.1 industrial codes but issues do arise in terms of currency conversion and allowing for the effects of inflation. In the comparisons made here we focus on a nominal comparison, translating sterling and Irish pound values into their euro equivalents using current exchange rates. No allowance is made for inflation.

This approach was chosen because the interest here is in the North/South relativities rather than in productivity growth, but it does have two implications which are worth noting at this point. First, relativities between North and South and between different years can be affected by changes in the sterling-euro exchange rate. In fact sterling strengthened against the euro over the 1998 to 2000 period from 1.4887 in 1998 to 1.6422 in 2000 (1999 = 1.5192) suggesting that the currency conversion procedure will tend to exaggerate productivity growth in the North over the period. Second, because no allowance is made for inflation, price changes may also influence apparent productivity and sales changes from year to year. In almost all sectors output price changes over this comparatively short period were small, with rises in some sectors and falls in others.

Sectoral Overview

Comparison of figures on labour productivity (GVA per employee) for all manufacturing firms suggests the very different development paths of manufacturing, North and South, over the last decade or more (see Figure 2). Sales per employee and GVA per employee in the South are now almost twice their Northern average, and also rose significantly faster over the 1998 to 2000 period. Perhaps surprisingly given these differences, value added as a proportion of turnover was very similar, North and South, between 30 and 35 per cent of sales (see Figure 1). Wages and salaries, however, were a significantly higher share of value added in the North than in the South. The implication is that the remainder of value added, including returns to capital and knowledge inputs, were more significant in the South than in the North. These returns in the South consist of payments abroad to a considerable extent.

Focussing on comparable levels of labour productivity in individual sectors suggests that these can be divided into three sections:

- A group of mainly mature industries in which the productivity of the Northern and Southern industries are very similar (i.e. plus or minus 10 per cent). This group includes textiles; wood and wood products; pulp, paper and printing; rubber and plastics; basic metals; fabricated metal products; machinery and equipment; electrical machinery; motor vehicles and other transport equipment; and recycling.
- In four mature sectors productivity differs significantly (by more than 10 per cent) North and South being higher in the South in each case: food, drink and tobacco; furniture; clothing; and non-metallic mineral products. Some caution is necessary, however, in the interpretation of this comparison for food, drink and tobacco due to differences in data definitions, North and South.²²
- A group of sectors dominated by inward investment into the South with notable North/South differences in sales per employee and productivity. This group includes printing and the production of recorded media; chemicals and chemical products (including pharmaceuticals); office machinery and equipment; medical, precision and other instruments; and radio, television and communications equipment.

We focus on each group of sectors in turn.

Sectors with similar productivity, North and South

Textiles (NACE 17) remains a significant industry throughout the island, although having a strong concentration in Northern Ireland. This sector includes textile weaving, finishing of textiles, manufacture of made-up textile articles except apparel, and the manufacture of other textiles. The sector employs 8,500 people in Northern Ireland and 6,000 in the South. Levels of sales per employee in the sector, both North and South, remain well below the manufacturing average despite some growth in recent years. Otherwise, sales per employee, labour productivity, and value added as a proportion of turnover remain similar, North and South.

Wood and wood products (NACE 20) form a relatively small and diverse sector employing around 10,000 people, with relatively strong links to the construction industry. (Furniture production is included in NACE 36). Sales per employee in the wood and wood products sector were higher in 2000 than in 1998 and 1999, at around half to two-thirds of the manufacturing average. The increase in sales per employee in 2000 was reflected in increased productivity and, in Northern Ireland, an increase in value added as a proportion of turnover. Declines in the share of wages and salaries as a proportion of value added also hint at increasing capital intensity and mechanisation in the sector. As with textiles, however, the key comparative point is the similarity of sales per employee and productivity in the sector, North and South.

Paper, pulp and paper products (NACE 21) form another relatively small sector (employing 7,000 people in total), in which levels of sales per employee and productivity are very similar, North and South. Sales per employee in this sector increased marginally from 1998-2000, reaching circa €150,000/£91,000 per annum, with GVA per employee showing a very similar increase to reach around circa €60,000/£36,000 per annum.

²² In terms of food, drink and tobacco, one important difference exists between the Southern and Northern data definitions. In the North, sales include excise duties while these are excluded from GVA. In the South excise duties are included in both sales and GVA.

Rubber and plastics products (NACE 25) make up a highly diverse sector, employing nearly 11,000 people in the South and 7,000 in the North. The sector has progressed considerably since 1998, with increased sales per employee and productivity both North and South. Value added as a proportion of sales in the sector also remains above the manufacturing average despite some decline since 1998. The sector remains strongly labour intensive with wages and salaries comprising a higher proportion of value added than the average for all manufacturing both North and South.

Basic Metals (NACE 27) form a relatively small sector including the manufacture of basic iron, steel and basic metal products (including casting). The sector employs around 800 people in the North and around 3,000 in the South. The key indicators are marked most strongly by stability, and strong North-South similarities over the 1998-2000 period. One notable feature of this sector, reflecting the low level of value added in many of the products being manufactured, is a lower than average share of value added in turnover.

Closely linked to the basic metals sector is the much larger **fabricated metal products sector (NACE 28)**. This sector employs nearly 21,000 people in all, of which around 14,000 are in Ireland. The sector includes a diverse range of activities including: the manufacture of structured metal products; the manufacture of tanks reservoirs and containers of metal; the manufacture of central heating radiators and boilers; steam generators; forging, pressing, stamping and roll forming of metal; treatment and the coating of metals. Both sales per employee and productivity in this sector increased over the 1998-2000 period, with this being one of a minority of sectors where value added as a proportion of sales was higher in the North than in the South, i.e. Northern companies were engaged in higher value added production than their Southern counterparts.

The **machinery and equipment nec (NACE 29)** sector is broadly the same size as the fabricated metal products sector, employing 21,000 people in all, 14,500 of them in Ireland. This sector includes the manufacture of general-purpose machinery; agricultural and forestry machinery; machine-tools; weapons and ammunition; and domestic appliances. Sales per employee in both Northern Ireland and Ireland have increased since 1998 with sales per employee being 10-35 per cent higher in Northern Ireland throughout the period. Unlike the fabricated metal products sector, however, value added as a proportion of turnover was lower in Northern Ireland throughout the 1998-2000 period, suggesting Southern firms in this sector were engaged in higher value added production. This means that despite higher turnover per employee in the North, labour productivity was almost identical in the two areas. The slightly smaller **electrical machinery (NACE 31)** sector follows a very similar pattern, characterised by rising sales per employee in both areas and higher value added production in Ireland. In this sector, however, the effect of the higher value added to sales ratio in the South is to increase GVA per employee 10- 40 per cent above its Northern Ireland level. The final engineering sector in this group is **motor vehicles and other transport equipment (NACE 34/35)**, which in the North is dominated by Bombardier-Shorts. Despite this, turnover per employee is very similar in firms, North and South, with value added as a proportion of sales broadly in line with the manufacturing average.

Mature sectors with differential productivity

In four mature sectors, significant productivity differentials existed between North and South.

Food, drink and tobacco production (NACE 15-16) remains an important industry both North and South, employing in total around 70,000 people. Turnover per employee, both North and South, is one of the highest of any sector, with GVA per employee (labour productivity) around the manufacturing average in the South and above average in the North. Direct North/South productivity comparisons for this sector are difficult, however, due to the different treatment of excise duties in the Northern and Southern statistics.

Non-metallic mineral products (NACE 26) is another sector linked relatively strongly to the construction industry through the production of building products. The sector includes the manufacture of glass and glass products; ceramic tiles and flags; bricks, tiles and construction products, in baked clay; cement, lime and plaster; and articles of concrete, plaster and cement. Turnover per employee and GVA per employee in the sector have increased steadily since 1998, both North and South. Productivity and sales per employee, however, have remained 5-30 per cent lower in the North throughout the 1998-2000 period. Levels of value added in turnover and wages, and salaries as a proportion of GVA, remain similar North and South.

Clothing (NACE 18²³) is a sector in which both Northern Ireland and Ireland have a long manufacturing tradition. Employment in the sector has contracted rapidly in recent years in both parts of the island, falling from 9,100 to 5,000 in the South and from 11,700 to 8,200 in the North. Over the 1998-2000 period, however, sales per employee in the South started from a higher base and grew faster than that in Northern Ireland. As a result, GVA per employee in the South remained above that in Northern Ireland, with broadly similar shares of value added in turnover.

Furniture and other manufacturing nec (NACE 36) include the manufacture of furniture; jewellery and related articles; musical instruments; sports goods; games and toys; and miscellaneous manufacturing. The sector shows a broadly similar pattern of growth in sales per employee to clothing, except in the context of stable employment in Ireland and increasing employment in the North. Stable and similar levels of value added as a proportion of turnover, North and South, mean that GVA per employee has been consistently higher in the South.

23 In the South figures for this sector also include the manufacture of leather and leather products (NACE 19).

High-tech, inward investment dominated sectors

Inward investment into Ireland over the last decade in particular has reshaped the industrial landscape of the country on a macro-scale, and had profound implications for the performance of some specific sectors. In the Nace classification this is reflected in five sectors in which massive investments in large-scale production facilities, designed to serve a European or broader market, have generated extraordinary levels of sales and productivity growth. The most extreme difference is evident in the **office machinery and equipment (NACE 30)** sector, which employs around 21,000 people in Ireland, compared to only 1,500 in Northern Ireland. Here, turnover per employee in Ireland exceeded €900,000/£548,000 per annum by 2000 compared to €140,000/£85,000 per annum in Northern Ireland. Similarly, GVA per employee in this sector reached €120,000/£73,000 per annum by 2000, compared to €60,000/£37,000 in Northern Ireland.

Other sectors where inward investment has also been significant in recent years reflect the same strong geographic concentration in Ireland and similar North/South differentials in productivity and sales per employee. **Medical, precision and instruments (NACE 33)**, for example, employs around 18,000 people in the South and 1,500 in the North, while having GVA per employee in Ireland in 2000 of €102,000/£62,000 per annum compared to €40,000/£24,000 per annum in Northern Ireland. Similarly, the **chemicals and chemical products sector (NACE 24)** which includes pharmaceuticals, employed 23,000 people in Ireland and 3,500 in Northern Ireland. GVA per employee in this sector in Northern Ireland was well above the manufacturing average, reaching €118,300/£72,000 per annum in 2000, compared to €533,300/£325,000 per annum in Ireland.

Two other sectors fall into this group, although both have a more even geographical distribution and a more substantial representation in Northern Ireland. The **printing and production of recorded media (NACE 22)** sector employs nearly 20,000 people in Ireland and 5,000 people in Northern Ireland. However, the very different nature of the industry, North and South, is immediately evident from the turnover per employee figures, which have grown from €300,000/£183,000 to €500,000/£304,000 per annum from 1998-2000 in the South but remained less than €100,000/£61,000 per annum in Northern Ireland. In the North this sector retains its traditional character, dominated by small- to medium-sized printing companies; in the South these companies remain but are accompanied by a range of large-scale software reproduction and manufacturing facilities. Value added as a proportion of sales in the South is therefore lower than in the North, but GVA per employee is notably higher due to the much higher level of sales per employee.

A similar North/South pattern of employment is evident in **radio, television and communications equipment (NACE 32)**, with 15,000 employees in the South and around 6,500 in the North in 2000. Here, turnover per employee has grown rapidly and at a similar rate both North and South, reaching €380,000-400,000/£231,000-244,000 per annum in 2000. GVA per employee in Ireland, however, was nearly double that in Northern Ireland due to a much higher level of value added in sales. Production of electronic components, and in particular integrated circuits, is an important part of this sector in the South. This is a capital-intensive activity, which would help to explain the high level of value added in this sector in the South.

CHAPTER 5: FINAL REMARKS

Any examination of the trade data for Northern Ireland and Ireland emphasises the striking openness of both economies and therefore the importance of productivity and export competitiveness. In both economies too, despite its current difficulties, manufacturing remains the dominant source of external earnings. Manufacturing productivity and competitiveness therefore remains a key issue despite the increasing importance of services.

Looked at in terms of labour productivity up to the year 2000, it is possible to distinguish three groups of manufacturing sectors with contrasting performances, North and South:

- First, there are a group of mature industries, where inward investment has been limited and productivity levels are broadly similar, North and South. This group includes textiles; wood and wood products; pulp paper and printing; rubber and plastics; basic metals; fabricated metal products; machinery and equipment; electrical machinery; motor vehicles and other transport equipment; and recycling.
- Second, there are another group of mature industries in which significant differences are observed between Northern and Southern productivity, with the advantage being predominantly with Southern firms. This group includes furniture and miscellaneous industries; clothing; and non-metallic mineral products. Food, drink and tobacco also fall into this group but this may be due to differences in data definitions, North and South, rather than any real difference in productivity performance.
- The third group of sectors is dominated by high-tech industries where inward investment has been substantial and levels of productivity appear significantly higher in Ireland than in Northern Ireland. This group includes printing and the production of recorded media; chemicals and chemical products (including pharmaceuticals); office machinery and equipment; medical, precision and other instruments; and radio, television and communications equipment. For this latter group of sectors, the drivers of high productivity are fairly clear: high levels of capital investment; inward knowledge transfer - largely from the US; and economies of scale resulting from serving a European or broader market.

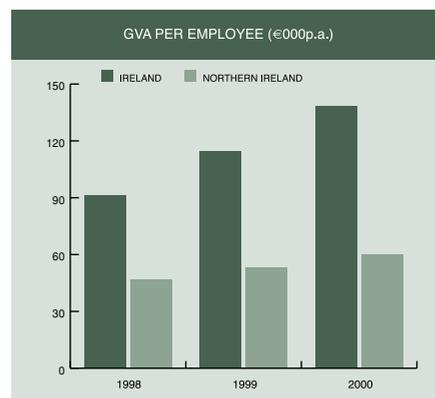
These contrasts between productivity performance, North and South, suggest the inadequacy of aggregate productivity comparisons and emphasise the importance of an industry-specific or enterprise-level approach. They also emphasise that within the island economy, significant productivity differences exist, creating the potential for improving overall performance by developing all-island benchmarking and the island-wide dissemination of best practice. The gains from any such initiative, however, are unlikely to be evenly shared. At least at a sectoral level, it appears that Northern firms have more to gain from such initiatives than Southern firms, many of which have higher current levels of productivity.

Identifying more specific policy initiatives to improve all-island productivity will require more detailed investigation to find out why productivity differences exist. For example, in the high-tech sectors it is not clear how much of the productivity differential is the result of 'local' production advantages and how much is attributable to 'imported' knowledge, capital or human resources. Even in the other maturer sectors, where levels of GVA per employee are broadly similar, it is not clear from the current analysis whether the determinants of productivity are the same. For example, it may be that higher levels of innovation in the South are compensating for lower levels of physical productivity, or that industrial derating in the North is offsetting higher energy or other costs. Even more interesting is the question of why, in some mature sectors - notably clothing, furniture and miscellaneous industries, and non-metallic mineral products - Southern firms have been able to establish a productivity lead over their Northern counterparts. Understanding these contrasts in performance will be important if effective policy is to be developed to improve living standards throughout the all-island economy.

APPENDIX 1

INDUSTRY DATA AND CHARTS

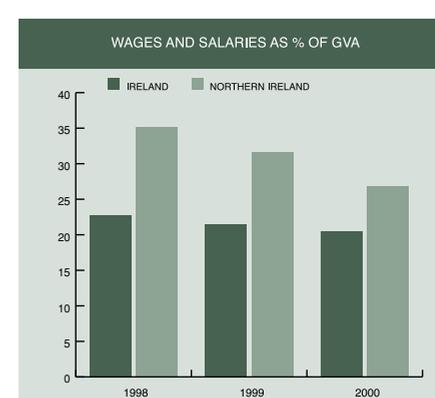
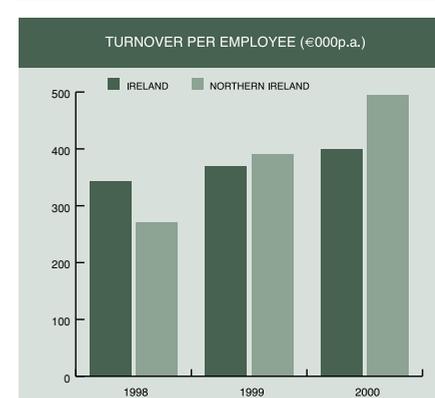
1. ALL MANUFACTURING (NACE 15-37)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	269.4	321.6	385.2
Gross Value Added per Employee (€000p.a.)	91.5	114.4	138.2
Wages and Salaries as % of GVA (%)	24.3	20.5	18.1
Value Added as % of Turnover	34.0	35.6	35.9
DATA VALUES			
Total Employment	242204	248350	255567
Total Turnover (€m)	65249	79857	98444
Total wages and salaries (€m)	5384	5824	6398
Total Purchases (€m)	43687	52355	64409
Purchases of Goods, Materials and Energy (€m)	288277	33341	39844
Purchases of Services (€m)	15410	19014	24565
Gross Value Added at Basic Prices (€m)	22166	28408	35316
NET Capital Expenditure (€m)	3376	3638	3272

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	140.5	170.3	207.6
Gross Value Added per Employee (€000p.a.)	46.6	53.1	60.0
Wages and Salaries as % of GVA (%)	51.0	46.8	47.5
Value Added as % of Turnover	33.2	31.2	28.9
DATA VALUES			
Total Employment	110250	111327	108904
Total Turnover (€m)	15486	18960	22605
Total wages and salaries (€m)	2618	2770	3109
Total Purchases (€m)	8619	9626	11524
Purchases of Goods, Materials and Energy (€m)			
Purchases of Services (€m)			
Gross Value Added at Basic Prices (€m)	5136	5914	6539
NET Capital Expenditure (€m)	947	762	876

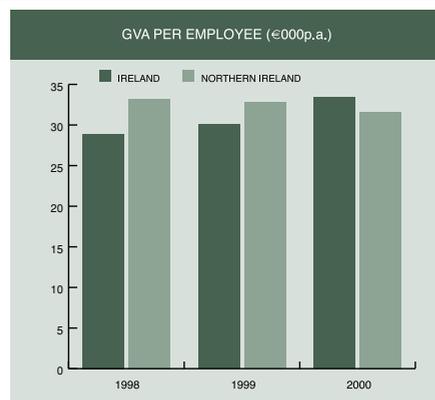
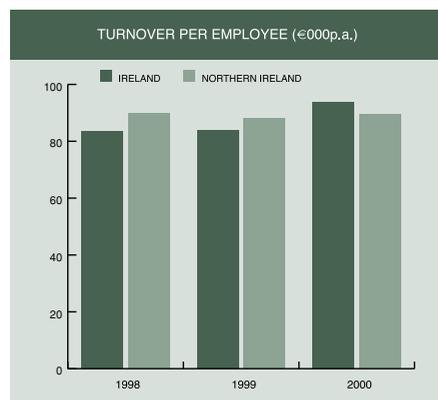
2. FOOD, DRINK AND TOBACCO (NACE 15-16)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	343.4	370.1	398.9
Gross Value Added per Employee (€000p.a.)	94.8	107.5	121.5
Wages and Salaries as % of GVA (%)	22.7	21.5	20.5
Value Added as % of Turnover	27.6	29.1	30.5
DATA VALUES			
Total Employment	47113	48270	48951
Total Turnover (€m)	16178	17865	19527
Total wages and salaries (€m)	1016	1117	1220
Total Purchases (€m)	11792	12752	13695
Purchases of Goods, Materials and Energy (€m)	8611	8948	9525
Purchases of Services (€m)	3181	3803	4170
Gross Value Added at Basic Prices (€m)	4467	5191	5949
NET Capital Expenditure (€m)	397	715	503

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	270.9	389.7	494.1
Gross Value Added per Employee (€000p.a.)	63.4	75.6	101.2
Wages and Salaries as % of GVA (%)	35.2	31.7	26.8
Value Added as % of Turnover	23.4	19.4	20.5
DATA VALUES			
Total Employment	20296	20442	19960
Total Turnover (€m)	5498	7966	9863
Total wages and salaries (€m)	453	490	542
Total Purchases (€m)	2450	2551	3008
Purchases of Goods, Materials and Energy (€m)	2184	2224	2667
Purchases of Services (€m)	267	327	341
Gross Value Added at Basic Prices (€m)	1287	1546	2021
NET Capital Expenditure (€m)	168	126	138

3. TEXTILES (NACE 17)



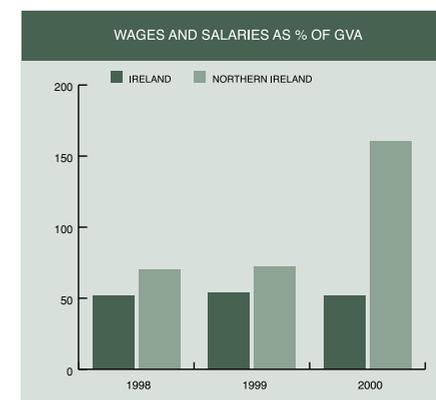
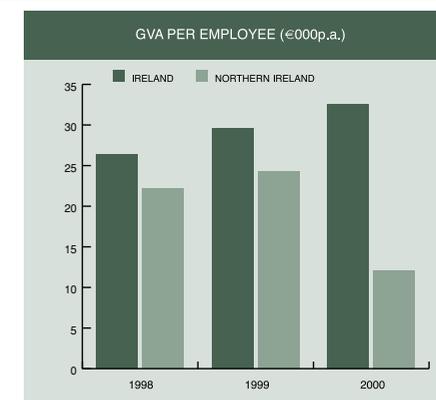
IRELAND

	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	83.5	83.9	93.6
Gross Value Added per Employee (€000p.a.)	28.9	30.1	33.4
Wages and Salaries as % of GVA (%)	58.6	58.9	58.5
Value Added as % of Turnover	34.6	35.9	35.7
DATA VALUES			
Total Employment	6445	5981	5992
Total Turnover (€m)	538	502	561
Total wages and salaries (€m)	109	106	117
Total Purchases (€m)	348	328	360
Purchases of Goods, Materials and Energy (€m)	286	271	294
Purchases of Services (€m)	62	57	66
Gross Value Added at Basic Prices (€m)	186	180	200
NET Capital Expenditure (€m)	11	22	40

NORTHERN IRELAND

	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	89.7	88.0	89.4
Gross Value Added per Employee (€000p.a.)	33.2	32.8	31.6
Wages and Salaries as % of GVA (%)	64.0	67.9	81.0
Value Added as % of Turnover	37.0	37.2	35.3
DATA VALUES			
Total Employment	9319	9618	8402
Total Turnover (€m)	836	847	751
Total wages and salaries (€m)	198	214	215
Total Purchases (€m)	531	515	484
Purchases of Goods, Materials and Energy (€m)	429	413	391
Purchases of Services (€m)	102	102	93
Gross Value Added at Basic Prices (€m)	310	315	265
NET Capital Expenditure (€m)	50	32	24

4. CLOTHING (NACE 18)



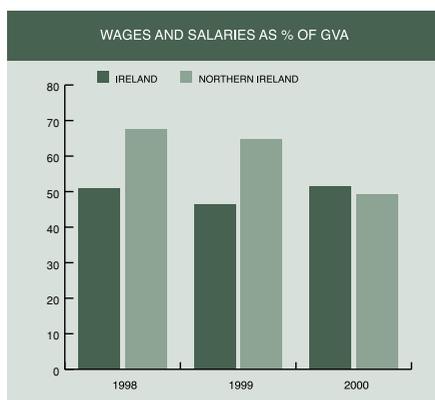
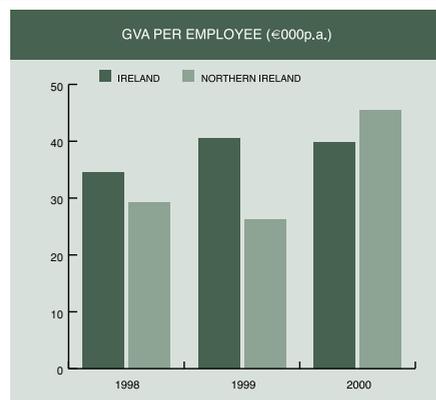
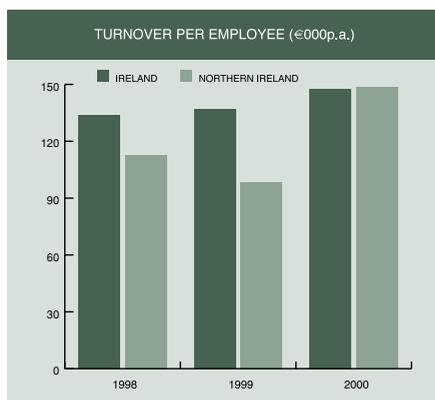
IRELAND

	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	65.4	81.4	91.1
Gross Value Added per Employee (€000p.a.)	26.4	29.6	32.5
Wages and Salaries as % of GVA (%)	51.9	53.6	52.1
Value Added as % of Turnover	40.4	36.4	35.7
DATA VALUES			
Total Employment	9119	6478	5009
Total Turnover (€m)	596	527	457
Total wages and salaries (€m)	125	103	85
Total Purchases (€m)	366	321	295
Purchases of Goods, Materials and Energy (€m)	296	255	232
Purchases of Services (€m)	70	66	63
Gross Value Added at Basic Prices (€m)	241	192	163
NET Capital Expenditure (€m)	10	12	11

NORTHERN IRELAND

	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	50.9	57.6	58.6
Gross Value Added per Employee (€000p.a.)	22.2	24.3	12.1
Wages and Salaries as % of GVA (%)	70.2	72.2	160.5
Value Added as % of Turnover	43.7	42.2	20.6
DATA VALUES			
Total Employment	11681	9966	8210
Total Turnover (€m)	594	574	481
Total wages and salaries (€m)	182	175	159
Total Purchases (€m)	343	340	375
Purchases of Goods, Materials and Energy (€m)	287	295	320
Purchases of Services (€m)	56	45	55
Gross Value Added at Basic Prices (€m)	260	242	99
NET Capital Expenditure (€m)	22	11	12

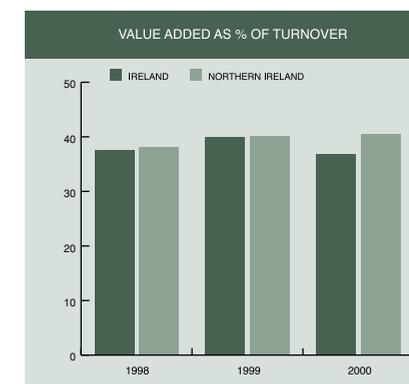
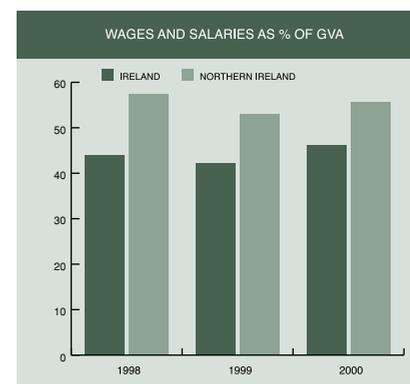
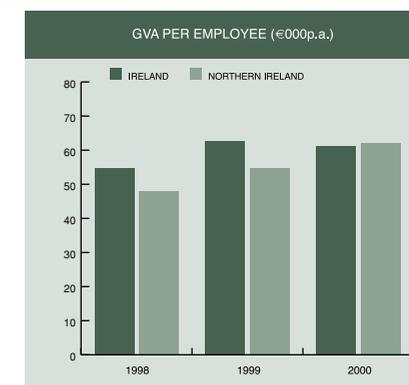
5. WOOD AND WOOD PRODUCTS (NACE 20)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	133.8	136.8	147.6
Gross Value Added per Employee (€000p.a.)	34.5	40.5	39.8
Wages and Salaries as % of GVA (%)	50.9	46.5	51.4
Value Added as % of Turnover	25.8	29.6	26.9
DATA VALUES			
Total Employment	5016	5583	6213
Total Turnover (€m)	671	764	917
Total wages and salaries (€m)	88	105	127
Total Purchases (€m)	506	551	688
Purchases of Goods, Materials and Energy (€m)	406	440	562
Purchases of Services (€m)	100	111	126
Gross Value Added at Basic Prices (€m)	173	226	247
NET Capital Expenditure (€m)	51	43	42

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	112.8	98.5	148.6
Gross Value Added per Employee (€000p.a.)	29.2	26.2	45.5
Wages and Salaries as % of GVA (%)	67.7	64.8	49.3
Value Added as % of Turnover	25.9	26.6	30.6
DATA VALUES			
Total Employment	3465	3156	3396
Total Turnover (€m)	391	311	505
Total wages and salaries (€m)	68	54	76
Total Purchases (€m)	289	215	362
Purchases of Goods, Materials and Energy (€m)	228	172	280
Purchases of Services (€m)	61	42	82
Gross Value Added at Basic Prices (€m)	101	83	154
NET Capital Expenditure (€m)	19	21	22

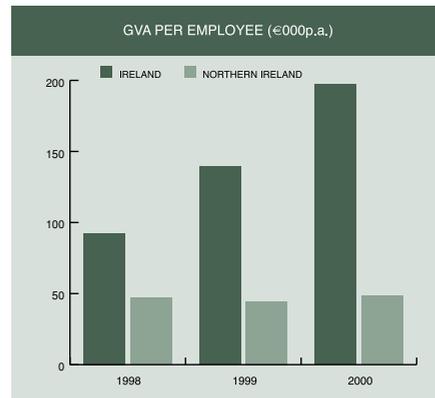
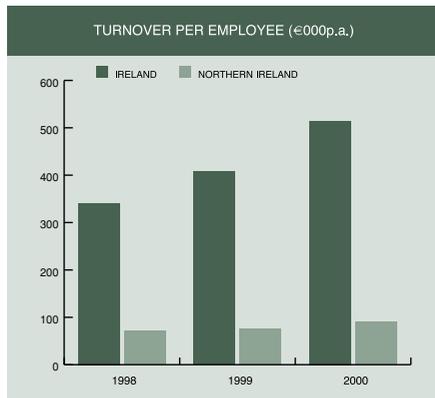
6. PAPER, PULP AND PAPER PRODUCTS (NACE 21)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	145.1	156.3	166.1
Gross Value Added per Employee (€000p.a.)	54.6	62.5	61.2
Wages and Salaries as % of GVA (%)	44.0	42.2	46.1
Value Added as % of Turnover	37.6	40.0	36.9
DATA VALUES			
Total Employment	4740	4701	4817
Total Turnover (€m)	688	735	800
Total wages and salaries (€m)	114	124	136
Total Purchases (€m)	433	441	512
Purchases of Goods, Materials and Energy (€m)	342	345	393
Purchases of Services (€m)	91	96	119
Gross Value Added at Basic Prices (€m)	259	294	295
NET Capital Expenditure (€m)	42	30	40

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	125.5	135.7	153.0
Gross Value Added per Employee (€000p.a.)	47.9	54.6	62.1
Wages and Salaries as % of GVA (%)	57.5	53.0	55.6
Value Added as % of Turnover	38.2	40.2	40.5
DATA VALUES			
Total Employment	2659	2601	2260
Total Turnover (€m)	334	353	346
Total wages and salaries (€m)	73	75	78
Total Purchases (€m)	210	208	207
Purchases of Goods, Materials and Energy (€m)	163	167	165
Purchases of Services (€m)	47	42	42
Gross Value Added at Basic Prices (€m)	127	142	140
NET Capital Expenditure (€m)	36	17	20

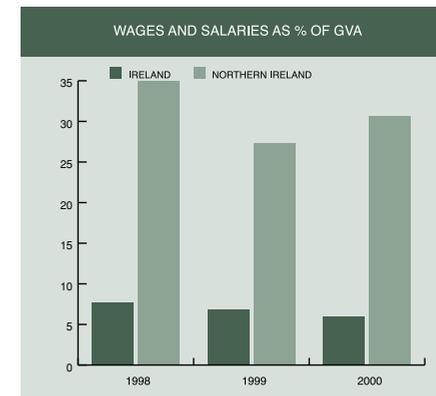
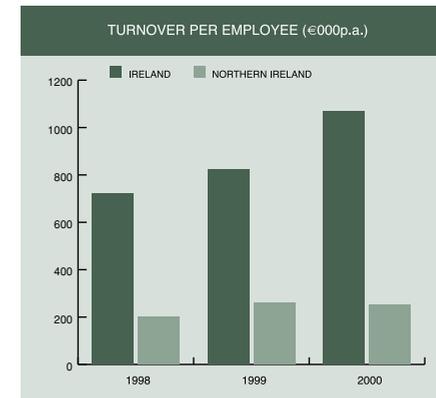
7. PRINTING AND PRODUCTION OF RECORDED MEDIA (NACE 22)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	340.8	407.6	514.4
Gross Value Added per Employee (€000p.a.)	92.5	139.5	197.4
Wages and Salaries as % of GVA (%)	27.4	19.6	14.6
Value Added as % of Turnover	27.2	34.2	38.4
DATA VALUES			
Total Employment	18520	19393	18743
Total Turnover (€m)	6311	7905	9642
Total wages and salaries (€m)	469	531	540
Total Purchases (€m)	4612	5219	5933
Purchases of Goods, Materials and Energy (€m)	1033	1209	1296
Purchases of Services (€m)	3579	4010	4637
Gross Value Added at Basic Prices (€m)	1714	2706	3700
NET Capital Expenditure (€m)	121	127	176

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	71.1	75.5	89.6
Gross Value Added per Employee (€000p.a.)	47.0	44.5	48.6
Wages and Salaries as % of GVA (%)	47.9	53.2	61.2
Value Added as % of Turnover	66.1	58.9	54.3
DATA VALUES			
Total Employment	4634	4706	4647
Total Turnover (€m)	329	355	416
Total wages and salaries (€m)	104	111	138
Total Purchases (€m)	118	135	190
Purchases of Goods, Materials and Energy (€m)	72	76	103
Purchases of Services (€m)	46	58	87
Gross Value Added at Basic Prices (€m)	218	209	226
NET Capital Expenditure (€m)	18	19	15

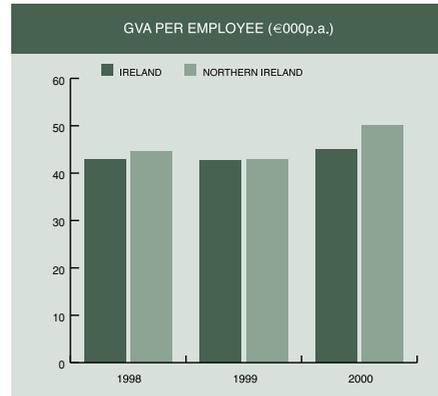
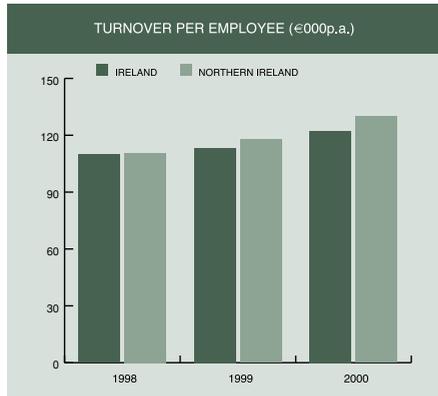
8. CHEMICALS AND CHEMICAL PRODUCTS (NACE 24)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	721.5	823.2	1070.1
Gross Value Added per Employee (€000p.a.)	375.6	437.9	533.3
Wages and Salaries as % of GVA (%)	7.7	6.9	6.0
Value Added as % of Turnover	52.1	53.2	49.8
DATA VALUES			
Total Employment	21415	22958	23134
Total Turnover (€m)	15451	18899	24756
Total wages and salaries (€m)	623	693	737
Total Purchases (€m)	7626	9311	12785
Purchases of Goods, Materials and Energy (€m)	3007	3462	4870
Purchases of Services (€m)	4619	5849	7915
Gross Value Added at Basic Prices (€m)	8044	10054	12338
NET Capital Expenditure (€m)	1082	1054	883

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	201.5	258.2	251.6
Gross Value Added per Employee (€000p.a.)	96.7	117.5	118.3
Wages and Salaries as % of GVA (%)	35.0	27.3	30.7
Value Added as % of Turnover	48.0	45.5	47.0
DATA VALUES			
Total Employment	4290	3463	3441
Total Turnover (€m)	864	894	866
Total wages and salaries (€m)	145	111	125
Total Purchases (€m)	473	494	478
Purchases of Goods, Materials and Energy (€m)	399	408	359
Purchases of Services (€m)	74	85	119
Gross Value Added at Basic Prices (€m)	415	407	407
NET Capital Expenditure (€m)	155	106	66

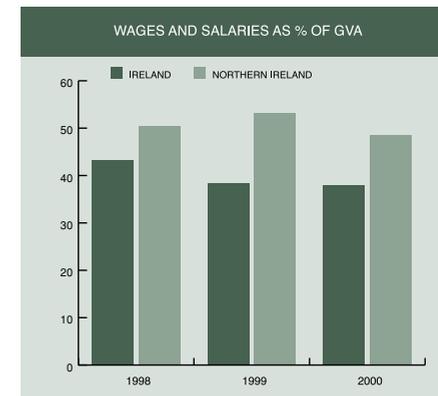
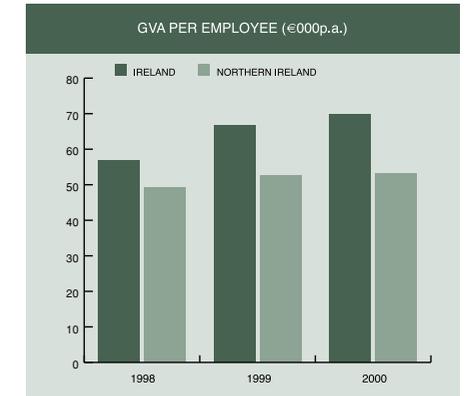
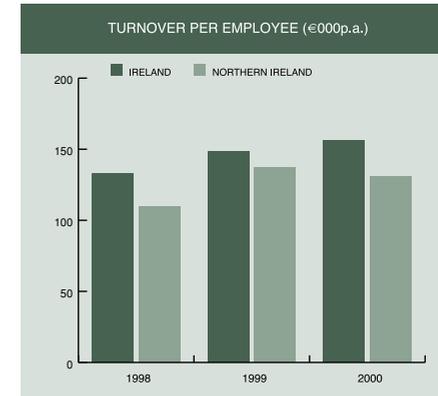
9. RUBBER AND PLASTIC PRODUCTS (NACE 25)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	110.0	113.2	122.2
Gross Value Added per Employee (€000p.a.)	42.8	42.7	45.0
Wages and Salaries as % of GVA (%)	46.2	48.0	47.6
Value Added as % of Turnover	38.9	37.8	36.8
DATA VALUES			
Total Employment	10476	10530	10823
Total Turnover (€m)	1152	1192	1323
Total wages and salaries (€m)	207	216	232
Total Purchases (€m)	711	761	859
Purchases of Goods, Materials and Energy (€m)	575	625	688
Purchases of Services (€m)	136	136	172
Gross Value Added at Basic Prices (€m)	448	450	487
NET Capital Expenditure (€m)	65	83	75

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	110.7	117.7	129.8
Gross Value Added per Employee (€000p.a.)	44.6	42.9	50.1
Wages and Salaries as % of GVA (%)	61.6	62.0	57.9
Value Added as % of Turnover	40.2	36.5	38.6
DATA VALUES			
Total Employment	7018	7331	6886
Total Turnover (€m)	777	863	894
Total wages and salaries (€m)	193	195	200
Total Purchases (€m)	459	554	553
Purchases of Goods, Materials and Energy (€m)	353	454	456
Purchases of Services (€m)	106	100	97
Gross Value Added at Basic Prices (€m)	313	315	345
NET Capital Expenditure (€m)	56	47	51

10. NON-METALLIC MINERAL PRODUCTS (NACE 26)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	132.7	148.7	156.1
Gross Value Added per Employee (€000p.a.)	56.7	66.6	69.9
Wages and Salaries as % of GVA (%)	43.3	38.4	37.9
Value Added as % of Turnover	42.7	44.8	44.8
DATA VALUES			
Total Employment	9977	10325	11051
Total Turnover (€m)	1324	1535	1725
Total wages and salaries (€m)	245	264	293
Total Purchases (€m)	764	852	985
Purchases of Goods, Materials and Energy (€m)	551	615	716
Purchases of Services (€m)	213	237	269
Gross Value Added at Basic Prices (€m)	566	688	773
NET Capital Expenditure (€m)	98	101	164

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	109.5	136.9	130.8
Gross Value Added per Employee (€000p.a.)	49.1	52.6	53.1
Wages and Salaries as % of GVA (%)	50.5	53.2	48.5
Value Added as % of Turnover	44.8	38.4	40.6
DATA VALUES			
Total Employment	5027	5654	6006
Total Turnover (€m)	551	774	785
Total wages and salaries (€m)	125	158	155
Total Purchases (€m)	313	445	484
Purchases of Goods, Materials and Energy (€m)	218	299	333
Purchases of Services (€m)	95	146	152
Gross Value Added at Basic Prices (€m)	247	298	319
NET Capital Expenditure (€m)	97	122	95

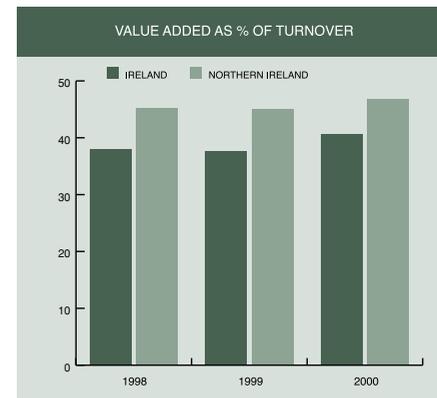
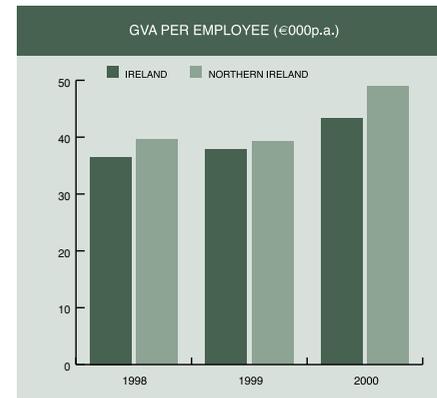
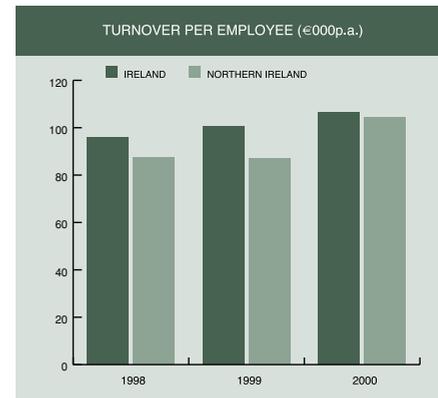
11. BASIC METALS (NACE 27)



IRELAND			
KEY RATIOS	1998	1999	2000
Total Turnover per Employee (€000p.a.)	155.0	140.9	165.5
Gross Value Added per Employee (€000p.a.)	43.5	39.5	49.0
Wages and Salaries as % of GVA (%)	58.9	70.6	56.8
Value Added as % of Turnover	28.1	28.0	29.6
DATA VALUES			
Total Employment	2458	2584	2979
Total Turnover (€m)	381	364	493
Total wages and salaries (€m)	63	72	83
Total Purchases (€m)	277	269	349
Purchases of Goods, Materials and Energy (€m)	228	217	288
Purchases of Services (€m)	49	52	61
Gross Value Added at Basic Prices (€m)	107	102	146
NET Capital Expenditure (€m)	33	27	27

NORTHERN IRELAND			
KEY RATIOS	1998	1999	2000
Total Turnover per Employee (€000p.a.)	153.0	185.6	150.8
Gross Value Added per Employee (€000p.a.)	63.4	48.6	43.4
Wages and Salaries as % of GVA (%)	32.5	51.7	56.3
Value Added as % of Turnover	41.4	26.2	28.8
DATA VALUES			
Total Employment	606	695	789
Total Turnover (€m)	93	129	119
Total wages and salaries (€m)	12	17	19
Total Purchases (€m)	60	97	85
Purchases of Goods, Materials and Energy (€m)	49	74	64
Purchases of Services (€m)	11	23	21
Gross Value Added at Basic Prices (€m)	38	34	34
NET Capital Expenditure (€m)	7	19	8

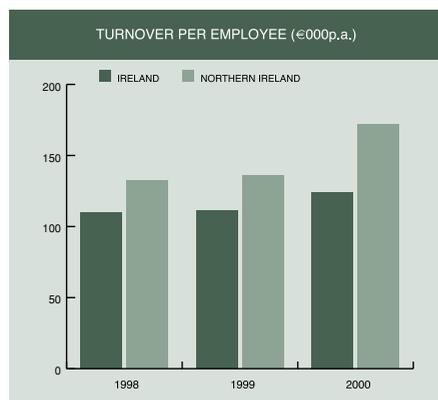
12. FABRICATED METAL PRODUCTS (NACE 28)



IRELAND			
KEY RATIOS	1998	1999	2000
Total Turnover per Employee (€000p.a.)	96.0	100.5	106.5
Gross Value Added per Employee (€000p.a.)	36.5	37.8	43.3
Wages and Salaries as % of GVA (%)	52.0	55.1	50.2
Value Added as % of Turnover	38.0	37.6	40.6
DATA VALUES			
Total Employment	12502	13085	14095
Total Turnover (€m)	1200	1315	1501
Total wages and salaries (€m)	237	272	306
Total Purchases (€m)	760	823	899
Purchases of Goods, Materials and Energy (€m)	612	664	733
Purchases of Services (€m)	148	159	166
Gross Value Added at Basic Prices (€m)	456	494	610
NET Capital Expenditure (€m)	42	48	61

NORTHERN IRELAND			
KEY RATIOS	1998	1999	2000
Total Turnover per Employee (€000p.a.)	87.5	86.9	104.5
Gross Value Added per Employee (€000p.a.)	39.6	39.2	48.9
Wages and Salaries as % of GVA (%)	59.9	61.9	56.8
Value Added as % of Turnover	45.3	45.1	46.8
DATA VALUES			
Total Employment	6186	6485	6906
Total Turnover (€m)	541	563	722
Total wages and salaries (€m)	147	157	192
Total Purchases (€m)	304	315	388
Purchases of Goods, Materials and Energy (€m)	212	230	280
Purchases of Services (€m)	92	85	108
Gross Value Added at Basic Prices (€m)	245	254	338
NET Capital Expenditure (€m)	34	12	33

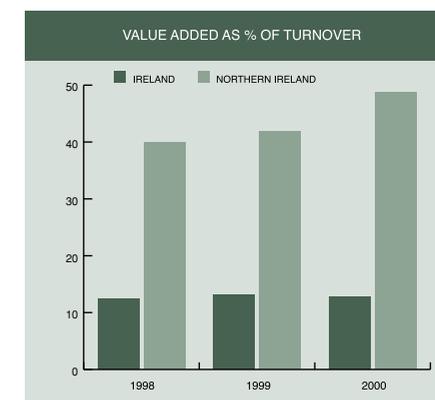
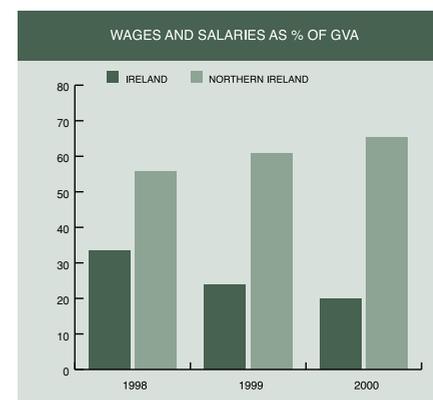
13. MACHINERY AND EQUIPMENT NES (NACE 29)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	109.9	111.1	124.3
Gross Value Added per Employee (€000p.a.)	43.4	44.6	49.0
Wages and Salaries as % of GVA (%)	46.0	48.5	48.7
Value Added as % of Turnover	39.5	40.2	39.4
DATA VALUES			
Total Employment	14668	14450	14409
Total Turnover (€m)	1612	1605	1791
Total wages and salaries (€m)	293	313	344
Total Purchases (€m)	988	976	1100
Purchases of Goods, Materials and Energy (€m)	801	799	884
Purchases of Services (€m)	187	177	216
Gross Value Added at Basic Prices (€m)	637	645	706
NET Capital Expenditure (€m)	71	77	90

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	132.2	136.0	171.9
Gross Value Added per Employee (€000p.a.)	40.0	37.9	51.8
Wages and Salaries as % of GVA (%)	60.4	65.4	59.7
Value Added as % of Turnover	30.2	27.8	30.1
DATA VALUES			
Total Employment	7055	6411	6551
Total Turnover (€m)	933	872	1126
Total wages and salaries (€m)	170	159	203
Total Purchases (€m)	644	621	761
Purchases of Goods, Materials and Energy (€m)	529	509	645
Purchases of Services (€m)	115	111	116
Gross Value Added at Basic Prices (€m)	282	243	339
NET Capital Expenditure (€m)	52	5	45

14. OFFICE MACHINERY AND EQUIPMENT (NACE 30)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	600.0	726.7	976.1
Gross Value Added per Employee (€000p.a.)	74.5	94.8	125.2
Wages and Salaries as % of GVA (%)	33.5	23.7	20.0
Value Added as % of Turnover	12.4	13.1	12.8
DATA VALUES			
Total Employment	16249	20130	20619
Total Turnover (€m)	9750	14628	20127
Total wages and salaries (€m)	405	452	516
Total Purchases (€m)	8591	12933	17756
Purchases of Goods, Materials and Energy (€m)	6723	9940	12810
Purchases of Services (€m)	1868	2993	4945
Gross Value Added at Basic Prices (€m)	1210	1909	2581
NET Capital Expenditure (€m)	347	400	354

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	127.7	132.7	136.3
Gross Value Added per Employee (€000p.a.)	51.0	55.5	66.6
Wages and Salaries as % of GVA (%)	55.8	60.7	65.4
Value Added as % of Turnover	40.0	41.8	48.8
DATA VALUES			
Total Employment	583	1484	1592
Total Turnover (€m)	74	197	217
Total wages and salaries (€m)	17	50	69
Total Purchases (€m)	46	112	112
Purchases of Goods, Materials and Energy (€m)	40	87	84
Purchases of Services (€m)	5	25	28
Gross Value Added at Basic Prices (€m)	30	82	106
NET Capital Expenditure (€m)	2		

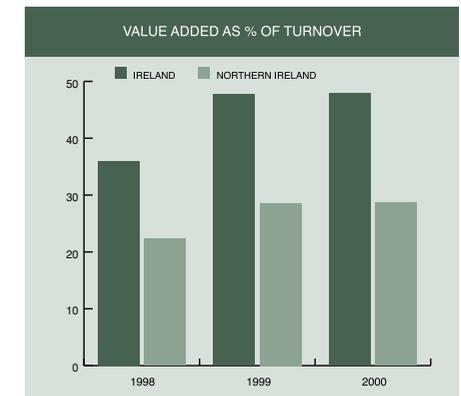
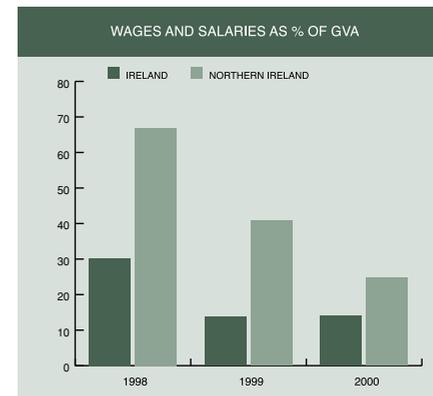
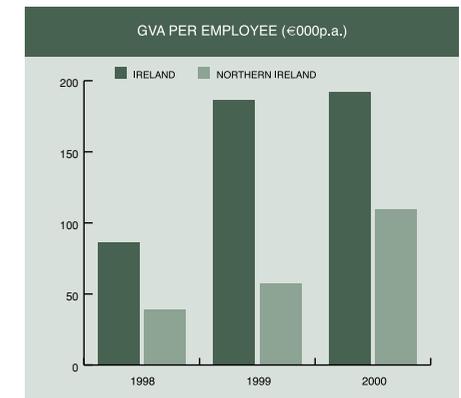
15. ELECTRICAL MACHINERY NES (NACE 31)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	122.1	125.5	166.2
Gross Value Added per Employee (€000p.a.)	50.1	47.4	73.5
Wages and Salaries as % of GVA (%)	40.3	43.8	31.1
Value Added as % of Turnover	41.0	37.8	44.2
DATA VALUES			
Total Employment	14583	14777	15271
Total Turnover (€m)	1781	1855	2538
Total wages and salaries (€m)	294	307	349
Total Purchases (€m)	1076	1167	1494
Purchases of Goods, Materials and Energy (€m)	870	916	1194
Purchases of Services (€m)	206	251	300
Gross Value Added at Basic Prices (€m)	730	701	1122
NET Capital Expenditure (€m)	107	105	166

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	137.5	149.7	159.0
Gross Value Added per Employee (€000p.a.)	40.5	39.7	51.7
Wages and Salaries as % of GVA (%)	55.2	61.2	57.3
Value Added as % of Turnover	29.8	26.5	32.5
DATA VALUES			
Total Employment	3205	3455	3898
Total Turnover (€m)	435	517	620
Total wages and salaries (€m)	72	84	116
Total Purchases (€m)	337	394	436
Purchases of Goods, Materials and Energy (€m)	299	343	405
Purchases of Services (€m)	38	50	31
Gross Value Added at Basic Prices (€m)	130	137	201
NET Capital Expenditure (€m)	49		38

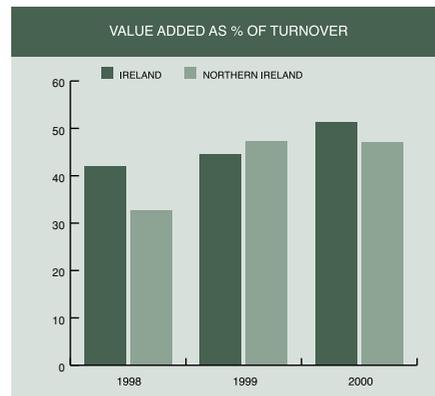
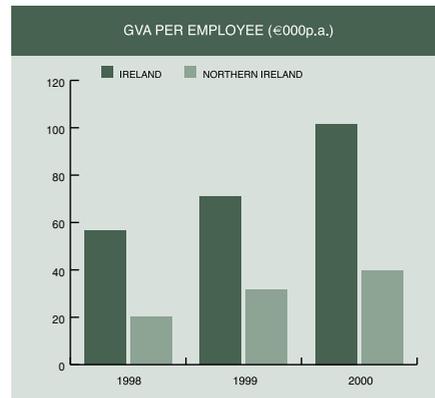
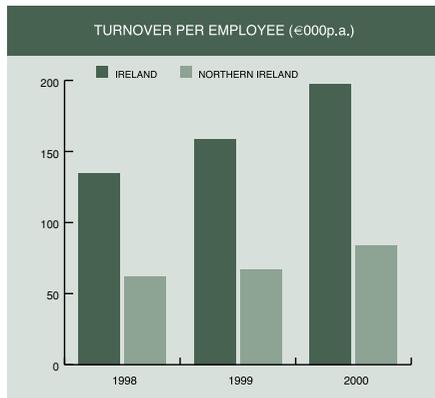
16. RADIO, TELEVISION AND COMMUNICATIONS EQUIPMENT (NACE 32)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	239.3	390.9	400.5
Gross Value Added per Employee (€000p.a.)	86.2	186.4	192.0
Wages and Salaries as % of GVA (%)	30.2	13.7	14.1
Value Added as % of Turnover	36.0	47.7	47.9
DATA VALUES			
Total Employment	13384	13357	15025
Total Turnover (€m)	3203	5221	6018
Total wages and salaries (€m)	348	342	407
Total Purchases (€m)	2113	2753	3347
Purchases of Goods, Materials and Energy (€m)	1748	2336	2707
Purchases of Services (€m)	355	417	640
Gross Value Added at Basic Prices (€m)	1154	2490	2885
NET Capital Expenditure (€m)	628	516	371

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	175.1	202.3	383.2
Gross Value Added per Employee (€000p.a.)	39.0	57.8	109.9
Wages and Salaries as % of GVA (%)	66.9	40.9	24.8
Value Added as % of Turnover	22.3	28.6	28.7
DATA VALUES			
Total Employment	5561	6047	6614
Total Turnover (€m)	974	1223	2534
Total wages and salaries (€m)	145	143	180
Total Purchases (€m)	736	998	2124
Purchases of Goods, Materials and Energy (€m)	685	945	1997
Purchases of Services (€m)	51	53	128
Gross Value Added at Basic Prices (€m)	217	349	727
NET Capital Expenditure (€m)	84	117	0

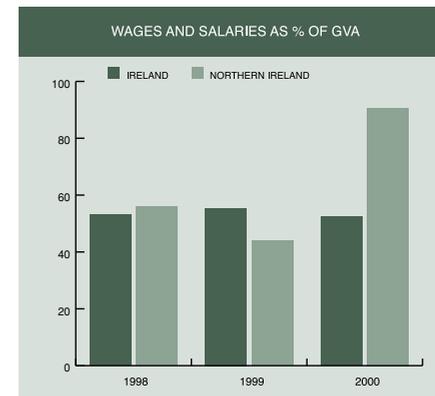
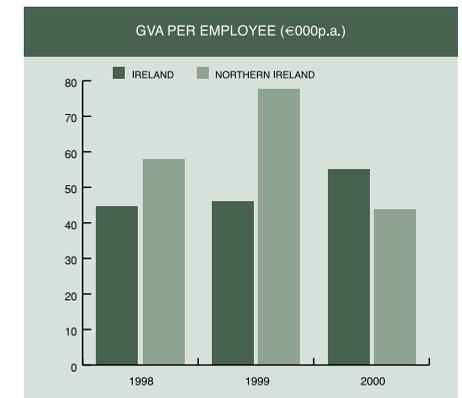
17. MEDICAL, PRECISION AND INSTRUMENTS (NACE 33)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	134.8	158.8	197.7
Gross Value Added per Employee (€000p.a.)	56.4	70.8	101.6
Wages and Salaries as % of GVA (%)	38.0	32.6	23.7
Value Added as % of Turnover	41.9	44.6	51.4
DATA VALUES			
Total Employment	15911	16885	18272
Total Turnover (€m)	2145	2681	3612
Total wages and salaries (€m)	341	390	441
Total Purchases (€m)	1303	1506	1820
Purchases of Goods, Materials and Energy (€m)	1040	1172	1438
Purchases of Services (€m)	263	334	382
Gross Value Added at Basic Prices (€m)	898	1195	1857
NET Capital Expenditure (€m)	170	114	135

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	62.2	67.1	83.9
Gross Value Added per Employee (€000p.a.)	20.3	31.7	39.5
Wages and Salaries as % of GVA (%)	92.4	71.5	72.0
Value Added as % of Turnover	32.6	47.3	47.1
DATA VALUES			
Total Employment	1617	1300	1522
Total Turnover (€m)	101	87	128
Total wages and salaries (€m)	30	29	43
Total Purchases (€m)	67	48	63
Purchases of Goods, Materials and Energy (€m)	49	38	50
Purchases of Services (€m)	18	10	13
Gross Value Added at Basic Prices (€m)	33	41	60
NET Capital Expenditure (€m)	2		6

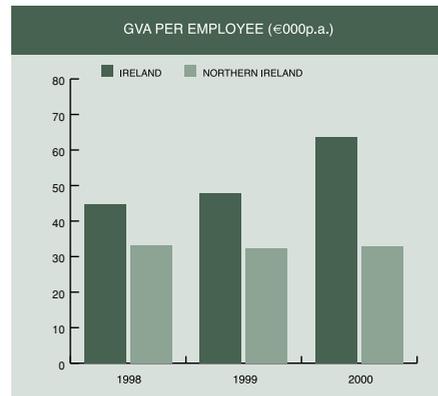
18 MOTOR VEHICLES AND OTHER TRANSPORT EQUIPMENT (NACE 34-35)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	122.6	122.2	137.3
Gross Value Added per Employee (€000p.a.)	44.6	46.0	55.2
Wages and Salaries as % of GVA (%)	53.2	55.4	52.3
Value Added as % of Turnover	36.4	37.7	40.2
DATA VALUES			
Total Employment	7464	7883	7900
Total Turnover (€m)	915	963	1085
Total wages and salaries (€m)	177	201	228
Total Purchases (€m)	589	609	687
Purchases of Goods, Materials and Energy (€m)	461	484	534
Purchases of Services (€m)	128	125	153
Gross Value Added at Basic Prices (€m)	333	363	436
NET Capital Expenditure (€m)	35	64	46

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	141.5	150.2	135.3
Gross Value Added per Employee (€000p.a.)	58.0	77.7	43.8
Wages and Salaries as % of GVA (%)	55.9	43.9	90.7
Value Added as % of Turnover	41.0	51.7	32.4
DATA VALUES			
Total Employment	12499	13454	12505
Total Turnover (€m)	1769	2021	1692
Total wages and salaries (€m)	405	458	497
Total Purchases (€m)	1001	1338	1077
Purchases of Goods, Materials and Energy (€m)	802	960	886
Purchases of Services (€m)	200	378	191
Gross Value Added at Basic Prices (€m)	725	1045	548
NET Capital Expenditure (€m)	74	58	78

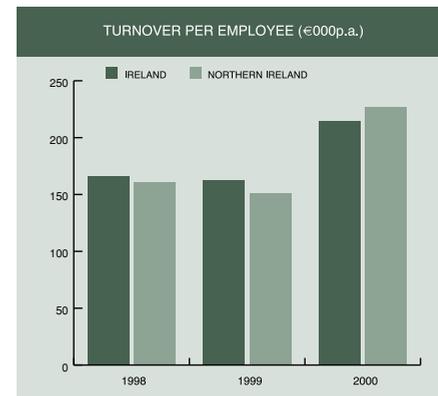
19. FURNITURE, OTHER MANUFACTURING NEC (NACE 36)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	110.3	117.5	124.5
Gross Value Added per Employee (€000p.a.)	44.7	47.9	63.5
Wages and Salaries as % of GVA (%)	42.0	41.2	32.3
Value Added as % of Turnover	40.5	40.7	51.0
DATA VALUES			
Total Employment	11935	10759	11204
Total Turnover (€m)	1316	1264	1395
Total wages and salaries (€m)	224	212	230
Total Purchases (€m)	815	761	803
Purchases of Goods, Materials and Energy (€m)	668	628	647
Purchases of Services (€m)	147	134	156
Gross Value Added at Basic Prices (€m)	533	515	712
NET Capital Expenditure (€m)	64	99	84

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	76.2	76.7	85.8
Gross Value Added per Employee (€000p.a.)	33.1	32.3	32.8
Wages and Salaries as % of GVA (%)	49.5	54.3	52.2
Value Added as % of Turnover	43.5	42.1	38.3
DATA VALUES			
Total Employment	3892	4297	4544
Total Turnover (€m)	297	330	390
Total wages and salaries (€m)	64	75	78
Total Purchases (€m)	174	195	241
Purchases of Goods, Materials and Energy (€m)	133	143	160
Purchases of Services (€m)	41	51	81
Gross Value Added at Basic Prices (€m)	129	139	149
NET Capital Expenditure (€m)	12	11	12

20. RECYCLING (NACE 37)



IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	165.9	162.9	214.5
Gross Value Added per Employee (€000p.a.)	48.0	58.8	69.3
Wages and Salaries as % of GVA (%)	36.4	38.5	33.3
Value Added as % of Turnover	28.9	36.1	32.3
DATA VALUES			
Total Employment	229	221	303
Total Turnover (€m)	38	36	65
Total wages and salaries (€m)	4	5	7
Total Purchases (€m)	27	23	43
Purchases of Goods, Materials and Energy (€m)	21	17	34
Purchases of Services (€m)	6	6	9
Gross Value Added at Basic Prices (€m)	11	13	21
NET Capital Expenditure (€m)	2	-1	2

NORTHERN IRELAND			
	1998	1999	2000
KEY RATIOS			
Total Turnover per Employee (€000p.a.)	160.7	151.1	226.6
Gross Value Added per Employee (€000p.a.)	49.3	53.9	94.9
Wages and Salaries as % of GVA (%)	43.6	33.1	37.7
Value Added as % of Turnover	30.7	35.7	41.9
DATA VALUES			
Total Employment	261	268	348
Total Turnover (€m)	42	41	79
Total wages and salaries (€m)	6	5	12
Total Purchases (€m)	29	26	48
Purchases of Goods, Materials and Energy (€m)	21	18	42
Purchases of Services (€m)	8	8	5
Gross Value Added at Basic Prices (€m)	13	14	33
NET Capital Expenditure (€m)	7	1	0

FIGURE LEGEND	NACE CODES	SECTORAL DESCRIPTIONS
15	15-16	Food, drink, tobacco
17	17	Textiles
18	18	Wearing apparel
20	20	Wood and wood products
21	21	Pulp, paper and paper products
22	22	Publishing, printing, recorded media
24	24	Chemicals and chemical products
25	25	Rubber and plastic products
26	26	Other non-metallic mineral products
27	27	Basic metals
28	28	Fabricated metal products
29	29	Machinery and equipment nec
30	30	Office machinery and equipment
31	31	Electrical machinery nec
32	32	Radio, television and communications
33	33	Medical, precision and instruments
34	34-35	Motor vehicles, other transport
36	36	Furniture, manufacture nec
37	37	Recycling
All	15-37	All manufacturing

APPENDIX 2

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