



Productivity, Profitability and the Cost Structure of Manufacturing Firms in Ireland and Northern Ireland

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Executive Summary

1. In this paper we use newly compiled data from the Northern Ireland ABI and Irish Census of Industrial Production to compile comparable cost and market exposure profiles for firms in different sectors and sizebands.
2. These cost breakdowns will be the cornerstone of the disaggregated business models within the All Island Business Model. For example, the analyses of market exposure will help us to identify how differential growth in Irish and European markets, say, will influence the growth of demand for firms in different sectors. Similarly, the cost breakdowns will help us to assess the sensitivity of firms in each sector and sizeband to different types of cost changes.
3. Productivity growth – driven largely by increased specialisation in high-tech industries and increasing capital intensity – has been a key element of growth in Ireland over past decades. Indeed, the evidence suggests that labour productivity growth has accounted for a larger proportion of Irish growth than that in many other countries. The evidence on Northern Ireland is less clear but levels of capital investment seem to have remained above the UK average and productivity growth has been relatively strong in UK terms.
4. Productivity differs markedly between sectors and between Ireland and Northern Ireland in some sectors. This has been discussed in an earlier AIBM research report as has the link between innovation and productivity.
5. A key focus of this report is disaggregated – sectoral analysis – but some similarities are evident between aggregate cost structures in NI and Ireland:

- a. Spending on materials and other inputs as a proportion of sales is broadly similar in the two areas – 63.4 per cent in Northern Ireland and 66.6 per cent in Ireland.
 - b. Value added as a proportion of sales is also broadly similar, accounting for 37.3 per cent of sales in Northern Ireland and 33.9 per cent in Ireland. In Ireland there is a notable difference between value added in Irish-owned firms (26.9 per cent of turnover) and externally-owned firms (35.5 per cent of turnover).
 - c. Capital expenditure accounted for between 3.8 and 4.6 per cent of sales in both areas, although larger differences were evident between individual sectors.
6. Three key differences are also evident between the aggregate cost structures:
- a. **Patterns of trade exposure** differ markedly between NI and Ireland, with implications for product demand and business growth. Northern Ireland remains strongly linked to the UK market which accounts for 55 per cent of sales, but only 14 per cent of the sales of firms in Ireland. Irish-owned firms in Ireland and firms in Northern Ireland have similar levels of exposure to other EU markets, 15.1 and 10.6 per cent of sales respectively. This market accounts for a much higher percentage of the sales of externally-owned firms in Ireland (47.9 per cent), however.
 - b. **Labour costs** as a proportion of sales differed significantly between areas accounting for 18.0 per cent of sales in NI, 16.4 per cent in Irish-owned firms but only 5.9 per cent of sales in externally-owned firms in Ireland.
 - c. **Profits** accounted for 14.7 per cent of sales in NI compared to 6.5 per cent in Irish-owned firms but 25.9 per cent of sales in externally-owned companies.
7. The productivity effect of cost increases depend on the importance of the cost item and the initial level of industry value added. For Northern Ireland as a whole, a 10 per cent increase in costs therefore resulted in

a reduction in GVA of 17 per cent, a very similar amount to that which would occur in foreign-owned enterprises in Ireland. Value added in Irish-owned enterprises in Ireland would fall by more than a quarter given the same cost increase.

8. Similarly, the profitability effect of cost increases depends on the importance of the cost item and the initial level of profit margins. A 10 per cent materials cost increase has an average profitability impact of 30-40 per cent in both areas. Labour cost impacts (a 10 per cent rise) on profitability average 12 per cent in Northern Ireland, and 4 per cent in Ireland. Capital cost effects are in general smaller due to the lesser importance of capital as a cost item. In Northern Ireland a 10 per cent capital cost increase would reduce profitability by 3.1 per cent (1.6 per cent in Ireland).
9. The greatest sensitivity to cost rises is unsurprisingly in more traditional sectors where value added and profitability are generally lower and labour and materials costs tend to comprise a larger proportion of revenue. Innovation in products, processes or business models represents a key challenge for these sectors.

Productivity, Profitability and the Cost Structure of Manufacturing Firms in Ireland and Northern Ireland

1. Introduction

Even within relatively small areas like Ireland and Northern Ireland, manufacturing firms exhibit great variety from large-scale production operations which are part of multi-national enterprises to small, bespoke manufacturers. Profound differences also exist between the investment priorities, skill needs and technological complexity of different manufacturing sectors. This variety suggests that elements in firms' common environment – related to labour costs, capital costs or the cost of material inputs or services – may have very different impacts on firms' competitive position.

In this paper we explore this issue, focussing on the cost structures of manufacturing firms in Ireland and Northern Ireland and exploring their sensitivity to changes in the cost of doing business. The aim is twofold. First, from a policy point of view, the study provides an indication of the likely sensitivity of firms in different sectors and sizebands to different types of cost pressure. Much has been made recently, for example, of labour cost increases in Ireland and its potential impact on international competitiveness¹. This impact will not be equally felt by all companies, however, and our study provides an indication of those sectors which are likely to be most seriously affected. Second, the study provides data on the cost sensitivity of firms of different types which can be incorporated into the All Island Business Model (AIBM) being developed by InterTradeIreland.

A limitation of the current study is that it does not take into account the longer-term competitiveness impact of cost changes. In other words, we do not

¹ For example, in the year to 2002, quarter 4, nominal hourly labour costs in Ireland rose 7.2 per cent compared to 3.9 per cent in the EU15 and 4.1 per cent in the UK. This rate of labour cost rise was higher than any of the other EU15 countries, although lower than a group of the accession countries. Source Eurostat, Euro-indicators news release, 112/2004. Available at http://epp.eurostat.ec.eu.int/cache/ITY_PUBLIC/3-15092004-AP/EN/3-15092004-AP-EN.PDF

consider the potential impact of cost changes on firms' level of sales, investment patterns or survival. Instead, we focus on identifying the scale of the productivity and profitability effect of the immediate cost 'hit' which firms would suffer from changes in different elements of their cost structure. In many ways, this focus – which essentially assumes that firms are price takers in their product markets - may not be unreasonable, however, given the relatively small market share of many Northern Ireland and Irish firms in European and world markets. An earlier paper in the AIBM project, for example, identified that in 2002 Ireland accounted for only 2.1 per cent of all EU9 manufacturing output, with Northern Ireland accounting for around 0.4 per cent (O'Malley and Anyadike-Danes, 2004).

The remainder of this report is organised as follows:

- Section 2 reviews previous studies which have examined differential productivity and profitability in Ireland and Northern Ireland;
- Section 3 examines the revenue and cost structures of manufacturing firms in the two areas;
- Section 4 focuses on the impact of cost changes on productivity
- Section 5 examines the impact of cost changes on profitability;
- Section 6 summarises the main points and highlights some policy implications;
- Section 7 summarises the main implications for the all island business model.

2. Productivity in Ireland and Northern Ireland: Comparisons and Determinants

In this section we briefly review previous studies of North-South productivity and profitability differentials and their determinants.

2.1 Overview

Statistical comparisons of industry in Ireland and Northern Ireland have repeatedly stressed the relatively rapid increase in productivity in Ireland since the mid-1960s. Hitchens et al. (1990, Table 19.2), for example, based on a comparison of Census of Production data (and using market exchange rates), suggested that manufacturing labour productivity in Ireland rose from 101 per cent of that in Northern Ireland in 1963 to 159 per cent of that in Northern Ireland by 1984. Likewise, Birnie and Hitchens (1998), while acknowledging difficulties associated with transfer pricing, note that:

‘Irish national accounts data, at least if taken at face value, imply a remarkable improvement in the relative performance of the macro-economy. Throughout the 1920s to the mid-1980s levels of GDP per capita in Ireland were never better than 65 per cent of the UK average. However, since 1986 an apparent very powerful convergence process has pushed Ireland up to over 90 per cent of the UK level; in less than one decade, three-quarters of the longstanding gap in per capita national income levels has gone’ (Birnie and Hitchens, 1998, p. 223).

Different factors can account for such differential productivity growth at regional or national level such as increases in labour productivity (output per hour), or differential patterns of growth of factor inputs. Studies using alternative approaches, however, have emphasised the dominant importance of productivity increases in Irish growth rather than increases in the level of factor inputs. Birnie and Hitchens (1998), for example, use Census of Production data to compare productivity in Ireland and the UK, and conclude that ‘if we wish to investigate the nature and extent of apparent convergence between Irish and UK GDP per capita levels we must consider in more detail the character of Irish comparative manufacturing productivity performance’ (p. 226). Similarly, using a very different growth accounting approach, Felisberto (2003) concludes that, in Ireland, growth over the 1990s has been dominated by TFP growth: ‘Factors such as increased labour productivity and efficiency,

use of labour in an intensive way and foreign investment (whose repercussions are spread to the whole economy and through time) have largely been contributing to Irish productivity growth' (p. 1). More specifically, Felisberto (2003, p.25) suggests that half of Irish productivity growth over the 1960-2002 period is accounted for by increases in capital and labour inputs with half being due to TFP growth². Recent EU studies also place a similar weight on the growth in manufacturing productivity in Ireland. Of labour productivity growth of 8.4 per cent from 1996-2000, for example, 7.3 pp was attributed to growth in manufacturing productivity in Ireland compared to 0.7 pp of total growth of 1.7 per cent in the EU (EU Commission, 2003, p. 86).

A key contributor to productivity growth in Ireland has, of course, been FDI, and as early as 1989 Birnie and Hitchens (1998), suggest this had created a significant productivity differential between Ireland and the UK. Comparing Census of Production data from Ireland and the UK, they suggest that in 1989 (Table 5):

- (a) Manufacturing productivity in externally-owned firms in Ireland was 69 per cent above that of externally-owned firms in the UK, while indigenously-owned firms in Ireland lagged 8 per cent behind indigenously-owned firms in the UK.
- (b) The productivity differential between externally-owned and indigenously owned firms in Ireland was 178 per cent compared to 52 per cent in the UK.

Hence Cassidy (2004) in his recent review of Irish productivity growth concludes that:

'Ireland's superior productivity performance in manufacturing has been largely a consequence of two factors, namely higher productivity growth

² By contrast in Portugal she attributes almost all of the growth in aggregate productivity to an increase in factor inputs. Notably, however, Felisberto (2003) shows no awareness of the potential importance of the transfer pricing issue in the case of Ireland.

in the high-technology sectors than the European average and also a greater degree of specialisation in these sectors' (p.93).

In Northern Ireland too, recent improvements in productivity have been strongly influenced by the high-tech sectors, dominated by externally owned firms. Roper (2002) based on an analysis of Index of Production data, for example, suggests that from 1995-2001, manufacturing productivity in Northern Ireland rose 36.2 per cent, with two-thirds of this improvement due to rapid improvements in a single sector – electronics - which was itself due to changes in a handful of companies. The rise in aggregate manufacturing productivity in Northern Ireland over the 1995-2000 period was markedly higher than that in the UK as a whole (11 per cent), meaning that by 2000 productivity (sales per employee) in Northern Ireland was marginally above that in the UK. Excluding electronics and transport equipment still suggests that NI productivity rose by 14.5 per cent compared to 2.6 per cent in the UK over the 1995-2000 period.

Comparisons with other UK regions also suggest faster productivity growth in Northern Ireland during the latter half of the 1990s than elsewhere. For example,

in 1995, manufacturing productivity in Northern Ireland was 24 pp behind that in Scotland. From 1995-2000, Northern Ireland manufacturing as a whole made up 7 pp of this deficit. Compared to Wales, Northern Ireland manufacturing made up 14 pp of an initial 24 pp gap. At a sectoral level too this pattern of 'catch-up' is evident with productivity in NI electronics, for example, rising from 50 to 80 per cent of that in the Scottish sector. Textiles productivity also rose from 78 to 92 per cent of that in Scotland.

2.2 North-South Productivity Comparisons

As the brief overview of the previous section suggests, economy wide productivity grew rapidly both in Northern Ireland and Ireland over the 1990s and despite some slowdown in recent years, both economies have a relatively

impressive record of recent productivity growth³. Key to the performance of both economies have been improvements in levels of productivity by individual firms, for as Cassidy (2004) remarks:

‘Generally speaking, improvements in productivity are realized at the level of the firm; economy wide productivity levels (growth rates) are, therefore, primarily an aggregation of the productivity levels (growth rates) of individual firms’. (p.83).

O’Malley and Roper (2003) provide the most recent comparison of productivity levels, North and South. Based on a comparison of competitiveness indicators derived from the Northern Annual Business Inquiry and Southern Census of Industrial Production, they suggest that in 2000 average labour productivity in manufacturing in the South (€138,000) was more than double that in the North (€60,000). However, they also stress the marked disparities both between sectors within each jurisdiction (e.g. in chemicals and chemical products - which includes pharmaceuticals - GVA per employee was almost four times the Southern manufacturing average in 2000), and markedly different North-South relativities between sectors. In particular, they stress the much higher level of productivity in those Southern sectors where inward investment has been important, and the potential distortion due to transfer pricing⁴.

At a sectoral level their comparisons, based on the 1998-2000 period, suggests four sectors in which Northern productivity was more than 10 per

³ Real GDP in the Republic of Ireland 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. 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.

Source: O’Malley and Roper, 2003.

⁴ Birnie and Hitchens (1998) discuss the issue of transfer pricing in some detail and conclude that: ‘By its very nature, transfer pricing may be intractable factors if the official statistics alone are used (as we have demonstrated, a variety of plausible methods generate widely differing estimates of the scale of the phenomenon) ... Transfer pricing may be the greatest difficulty which a comprehensive investigation of Irish comparative productivity and relative GDP growth would have to consider’ (Birnie and Hitchens, 1998, p.231).

cent higher than that in the South (Table 1). 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 1000 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 their analysis, four had average productivity which differed by less than 10 per cent, North and South, and eleven sectors had productivity more than 10 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 (Nace 29) and Pulp, paper and paper products (Nace 21).

The eleven sectors in the Republic of 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 the Republic of Ireland was 16 per cent higher than that in Northern Ireland, while Southern food, furniture and clothing all had productivity levels more than 25 per cent higher than that in the North.

More generally, O'Malley and Roper (2003) argue that comparing the productivity performance of manufacturing sectors, North and South 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 falls 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 the Republic of 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, radio, television and communications equipment (Chapter 5).

No fully worked out analysis of the impact of these productivity differentials on the export shares of company growth has yet been undertaken. What is clear, however, is that during the 1990s both Ireland and Northern Ireland increased their share of EU production (O'Malley et al., 2004). Ireland's share of EU output increased from 0.88 per cent in 1991 to 2.12 per cent in 2000, while Northern Ireland's share of EU output increased from 0.3 per cent in 1991 to 0.4 per cent in 2000. Decomposing the increase in output over and above the EU level provides an indication of the sectoral sources of growth. In Ireland, some growth in EU output shares occurred in almost all manufacturing sectors, although growth was dominated by the impact of the 'high-tech', externally-dominated sectors. More specifically, from 1991-2000, Ireland's industrial output increased by \$51.8 billion more than it would have if each sector had simply maintained its share of EU production. Of this, \$48.2bn (93.0 per cent) was due to growth in output in externally-owned firms, while

\$3.6bn (6.9 per cent) was due to growth in indigenous industry (O'Malley et al., 2004)⁵.

2.3 The Determinants of Productivity Growth

Our previous discussion emphasises the dominant role of labour productivity improvements in shaping national growth in Ireland, and perhaps to a lesser extent in Northern Ireland. Broadly considered there are three possible explanations for increases in labour productivity at the level of the individual enterprise related to⁶:

- (a) The quality and utilisation of firms' human resources;
- (b) The use of technology and innovation; and,
- (c) Levels of capital investment and the efficiency of capital utilisation.

A key aim of the All Island Business Model will be to examine how these factors combine in different sectors and sizeband groups. In terms of improvements in skill or qualification levels, or more effective human resource management (HRM) or utilisation, the argument is basically that changing technology has placed an increasing premium on skilled labour (Nickell and Bell, 1995), and on the effective utilisation of firms' human resources. There is, therefore, an increasing emphasis on the importance of HRM practices in raising productivity, and now considerable evidence on the way in which HRM practices work to contribute to increased employee commitment and productivity^{7,8}. The recent National Competitiveness Report 2004 suggests

⁵ We do not include findings on indigenous or locally-owned industry in Northern Ireland because suitable data are not readily available for the North.

⁶ Cassidy (2003) provides a review of other economy-wide influences that might support long-term productivity growth – a stable macro-economic environment, the regulatory climate, labour market flexibility, financial markets and access to risk capital, educational attainment and R&D activity.

⁷ Boning, Ichniowski and Shaw (2001) in their study of U.S. steel mini mills, for example, found that the adoption of problem-solving teams or group-based incentive pay both increase a firm's productivity, but not as much as when these two practices are used together. Exploiting these complementarities, however, requires that firms adopt a coherent HRM system. Ichniowski et al. (1997), for example, grouped individual practices into seven HRM policy areas: incentive pay, recruiting, teamwork, employment security, job flexibility, training, and labour-management communication and found a marked productivity difference between firms adopting the most and least sophisticated HRM approaches.

something of a mixed picture in terms of investments in human capital and educational attainment in Ireland: while participation rates in third-level education in Ireland compare relatively well with competitor countries, levels of educational attainment for the entire population and levels of participation in life-long training lag somewhat behind international leading practice. Comparisons for Northern Ireland also tend to show high participation in tertiary education, relatively high levels of participation in life-long learning but also emphasise something of a skills deficit among older workers.

Evidence on the prevalence of high performance HRM practices in Ireland and Northern Ireland is relatively limited, but Roche (1999), for example, examined the adoption of HRM practices in Irish organisations designed to promote high levels of commitment⁹. His study focussed on firms with more than 50 employees and was based on a secondary analysis of the 1992 Price Waterhouse Cranfield International Survey of HRM. As in other studies with a similar focus (e.g. Michie and Sheehan, 2003), Roche specifies a number of aspects of HRM comprising the commitment model¹⁰. Examination of the prevalence of a commitment model among Irish firms leads Roche to conclude:

‘The incidence of the commitment model in Ireland is modest. This finding is in line with, and adds to, the body of international literature on the low overall incidence of coherent sets of commitment-oriented human resource practices’. (p. 669).

⁸ Evidence on the relationship between human capital and productivity in Ireland is relatively limited. One example, though, is Barrett and O’Connell (2001) who examined the impact of general and specific training provided by group of 215 enterprises in manufacturing, construction and private services and measured impact on productivity (in their case output per employee) over 1993-95 period. Reflecting earlier findings of Black and Lynch (1996) for the US they conclude that ‘the effect of general training is positive and statistically significant, while specific training has no statistically significant impact on productivity growth’. (p. 655)

⁹ Teague and McCartney (1997) focus more specifically on the adoption decisions of a similar range of HRM practices.

¹⁰ These include measures designed to reflect firms’ reward systems, management of employee voice, management of human resource flows, and management of work organisation (Roche, 1999, Table 1).

Roche also notes however that such practices are more common where firms are: 'non-union, multi-nationals, organisations with a high strategic capacity and firms competing in international markets (p. 670)'.

A second potential explanation for labour productivity increases is the more intensive application of technology. However, despite recent improvements levels of R&D investment both by government and business in Ireland and Northern Ireland remain relatively low by EU and OECD standards (Figure 2). Levels of innovation, however, remain relatively high by international standards in both NI and Ireland, consistently above that of the other Northern European countries (O'Malley et al., 2004). In general, plants in Ireland are also slightly more likely to be innovating than plants in Northern Ireland. Between 2000-2002, 56.6 per cent of manufacturing plants in Ireland were product innovators compared to 53.8 per cent in Northern Ireland (Table 2). This suggests something of an 'Irish Paradox': why are innovation and economic growth levels relatively high when R&D levels are relatively low? This applies most strongly to Ireland but is also evident in the North where growth has also been persistently above that in the UK and EU with below average R&D levels. Innovation and its relation to productivity were the subject of an earlier AIBM report (Roper and Love, 2005).

A third possible explanation for productivity increases are higher levels of investment which produce higher levels of capital per employee. Table 3 summarises data from Eurostat on relative levels of capital investment in manufacturing for the EU economies (some countries are omitted due to lack of data). These figures suggest that while Ireland has a broadly similar level of capital investment per unit of GVA to many other EU countries, levels of per capita capital investment (i.e. Part A) are relatively high. If, as we would expect, capital per employee is positively related to productivity this may provide part of the answer to the Irish paradox.

For Northern Ireland too there is some evidence that levels of capital expenditure per capita (and as a % of GVA) have been above UK levels. From 1998-2000, in particular Northern Ireland accounted for around 3.0-3.1

per cent of UK manufacturing investment, well above its employment share, although this fell back somewhat (to 2.8 per cent) in 2001¹¹. Even then, however, levels of investment in Northern Ireland remained marginally above the UK average as suggested by Table 4.

Capital utilisation has also come to be seen as a major determinant of productivity. In an Irish context, for example, McAdam and Duffner (1996) report an examination of the benefits of Total Productive Maintenance at Harris Ireland Ltd, introduced as part of the firm's overall TQ programme. The primary aim of TPM is to reduce downtime and so increase productivity, based on team-working and an anticipatory, preventative maintenance regime. Following a period of losses McAdam and Duffner (1996) conclude that 'adopting the TQM initiative is responsible for Harris Ireland's return to profitability in 1993 and its continued financial success' (p. 629).

Another aspect of investment which has received considerable recent attention is the potential productivity enhancing effect of ITC investment. Daveri (2001), for example, shows that ICT spending in Ireland as a percentage of GDP was around the EU average in 1992 (5.38 per cent compared to 5.26 per cent), and 1998 (5.88 per cent compared to 5.93 per cent), but had fallen behind the EU average by 2001 (6.21 per cent compared to 8.20 per cent). Using a growth accounting methodology Daveri decomposes the capital accumulation component of TFP into ICT related and 'other' categories. Based on ICT investment data he then estimates the contribution of ICT stimulated productivity changes to national GDP growth. In terms of labour productivity growth, he concludes that for Ireland, ICT capital added 0.35 pp to the growth in GDP per man hour through the later 1990s in addition to adding 0.59 pp to TFP growth. Only three EU countries (Ireland, Portugal and Greece) experienced positive growth effects from ICT through both effects. Daveri (2001) focuses on national trends, and therefore does not deal with Northern Ireland specifically. For the UK, however, his results suggest that during the later 1990s, ICT adoption added 0.68 pp to UK labour productivity growth but -0.41 pp to total factor productivity growth. Similar

¹¹ Source: Economic Trends, December 2003, Page 49.

results might be expected for Northern Ireland, however, as other studies have suggested that connectivity in Northern Ireland is close to the UK average although the picture in terms of on-line trading is somewhat different (i.e. below average levels of e-commerce but above average levels of EDI activity)¹².

Growth accounting studies such as Daveri (2002) and Felisburto (2003) provide a valuable indication of the sources of productivity change at aggregate level over the long-term. For the All Island Business Model, however, we require a more disaggregated, short-term analysis of the impact of cost changes on business competitiveness. In subsequent sections we therefore focus on two issues. First, in Section 3, we examine the sensitivity of firms' market position to changes in international and domestic market conditions. Section 4 then focuses on the impact of cost changes on productivity, and Section 5 examines the impact of cost changes on profitability.

3. Revenue and Cost Structures

In this section we briefly profile the revenue and cost structure of manufacturing in Ireland and Northern Ireland, prior to assessing the impact of various cost changes in Section 4. Data sources for the comparisons are outlined in Annex 1, but the main data sources are:

- For Northern Ireland, individual returns from the Annual Business Inquiry, the R&D survey (conducted in 1999, 2001 and 2002) and the Annual Survey of Sales and Exports. Northern Ireland data relates to the period 1998-2002
- For Ireland, special analyses of the Census of Industrial Production provided by the Central Statistical Office. Data for Ireland relates to the 2000-2002 period.

¹² Source: http://www.statistics.gov.uk/downloads/theme_economy/TBreport_revised_03Jul03.pdf

Reflecting the earlier discussion on productivity differences between Irish-owned and externally-owned firms, the CSO were able to provide a breakdown between Irish-owned and externally-owned firms in Ireland. No such breakdown is available for Northern Ireland because of confidentiality issues due to the small number of firms in some sectors and sizebands.

Tables 5 and 6 outline the broad revenue and cost structure of the whole of manufacturing industry in each area providing a breakdown of sales by broad geographical market and a breakdown of costs – expressed as percentages of total sales. Some similarities are evident between cost structures in NI and Ireland:

- Spending on materials and other inputs as a proportion of sales is broadly similar in the two areas – 63.4 per cent in Northern Ireland and 66.6 per cent in Ireland.
- Value added as a proportion of sales is also broadly similar, accounting for 37.3 per cent of sales in Northern Ireland and 33.9 per cent in Ireland. In Ireland there is a notable difference between value added in Irish-owned firms (26.9 per cent of turnover) and externally-owned firms (35.5 per cent of turnover).
- Capital expenditure accounted for between 3.8 and 4.6 per cent of sales in both areas, although larger differences were evident between individual sectors.

Three key differences are also evident between the aggregate cost structures:

- ***Patterns of trade exposure*** differ markedly between the two areas, with implications for product demand and business growth. Northern Ireland, in particular, remains strongly linked to the UK market which accounts for 55 per cent of sales, but only 14 per cent of the sales of

firms in Ireland. Irish-owned firms in Ireland and firms in Northern Ireland have similar levels of exposure to other EU markets, 15.1 and 10.6 per cent of sales respectively. This market accounts for a much higher percentage of the sales of externally-owned firms in Ireland (47.9 per cent), however.

- **Labour costs** as a proportion of sales differed significantly between areas accounting for 18.0 per cent of sales in NI, 16.4 per cent in Irish-owned firms but only 5.9 per cent of sales in externally-owned firms in Ireland.
- **Profits** accounted for 14.7 per cent of sales in NI compared to 6.5 per cent in Irish-owned firms but 25.9 per cent of sales in externally-owned companies.

At a sectoral level, differences are also evident in both market exposure and cost structure (Tables 7 and 8). In terms of sectors' market exposure:

- **Food and drink companies** tend – unsurprisingly - to have a home market focus which is stronger than that for all manufacturing firms. More surprisingly, however, there is little evidence that Ireland is a much more important market for Northern Irish food producers (8.5 per cent of sales) than it is for other Northern Ireland manufacturers (8.1 per cent of sales – Table 7). In more general terms, Northern Ireland food producers are exporting 12 per cent of their output beyond the UK and Ireland compared to 37.1 per cent of Irish output.
- **Textiles and clothing** like food and drink manufacturing has a strong UK and Ireland focus, accounting for 55-70 per cent of sales. The Irish textile industry has a stronger focus on continental Europe accounting for 30.1 per cent of sales (10.4 per cent in Northern Ireland).

- **Wood and wood products** – serves a predominantly local market which accounts for 90 per cent of sales. Northern Ireland firms in this sector have a strong focus on the Irish market which accounts for 26.6 per cent of sales (8.1 per cent in all manufacturing firms).
- **Paper and printing** firms in each area have very different market orientations. Irish firms sell only 17.8 per cent of their output in Ireland and a similar amount in the UK but have a strong continental focus (54.5 per cent of sales). Northern Ireland firms, on the other hand, sell more than half (56.6 per cent) of their output in Northern Ireland.
- **Chemicals** is a strongly export-oriented industry in both Ireland (90 per cent of sales) and Northern Ireland (70 per cent of sales).
- **Rubber and plastics** firms in both Ireland and Northern Ireland serve a broad spread of markets with firms in Ireland having a stronger 'home' market orientation (Tables 7 and 8).
- The **Minerals and basic metals** sector in Northern Ireland has a strong UK and Ireland focus. This is the most domestically focussed of all industries in Ireland.
- The **machinery and equipment sector** – like chemicals – exhibits a broad market spread although notably the Irish market is less important than average for NI producers.
- **Electrical and Optical equipment** – Northern Ireland producers have a dual focus with a strong UK orientation and extra-EU focus. For producers in Ireland the dominant markets are the EU and USA.
- **Transport Equipment** producers in Northern Ireland have a similar focus to firms in the electrical and optical sector with UK and extra-EU markets dominating. Firms in Ireland have a stronger EU focus.

In terms of cost structure, marked differences are also evident between industries, and in some cases between Ireland and Northern Ireland (Tables 6 and 7). Clearly, the more important a cost item the greater is the sensitivity of a firm's competitive position to proportionate changes in cost. Sensitivity will also depend on current levels of margins, however, and whether these are high enough to absorb any increased costs. In the next section we take into account the impact of cost changes on levels of profitability. In the remainder of this section we focus on the relative importance of individual cost items (Tables 7 and 8):

- In terms of **materials** and other inputs the sectors most vulnerable to changes in costs are wood and wood products (NI), electrical and optical equipment in both areas and the leather sector in Ireland. Least cost sensitive are paper and printing in Northern Ireland, minerals in Ireland and the chemicals sector in both areas.
- In terms of changes in **labour costs** the most strongly affected sectors would be paper and printing in Northern Ireland, and textiles and transport equipment in both areas. The least affected are food manufacturing and electrical and optical equipment in both regions, and printing and paper in Ireland.
- Changes in **capital costs** will have the greatest impact on the costs of operating in chemicals (NI), minerals and metals in both areas and the leather industry in Ireland. Capital costs are less important in food and paper sectors in Ireland and the textiles and machinery sectors in Northern Ireland.

Differences are also evident in market orientation and cost exposure between smaller and larger firms. Larger firms are typically more export oriented and have a lower exposure to changes in material and other input costs and labour costs (Table 9).

4. Cost Pressures and Productivity

Productivity – value added per employee – is determined primarily by the difference between sales revenue and material and other input costs. In examining the impact on productivity of cost increases the two key ratios are therefore material and input costs as a proportion of sales and value added as a proportion of sales. The productivity effect of any cost increase will clearly be greatest when inputs are a large proportion of sales and value added is consequently a small proportion of sales.

For Northern Ireland as a whole, for example, materials and other costs accounted for 63.4 per cent of sales over the 1998-2002 period and GVA accounted for 37.3 per cent of sales. A 10 per cent increase in costs therefore resulted in a reduction in GVA of 17 per cent, a very similar amount to that which would occur in foreign-owned enterprises in Ireland (Table 10). Value added in Irish-owned enterprises in Ireland would fall by more than a quarter given the same cost increase.

At a sectoral level there is considerable variation in the productivity impact of material cost changes (Tables 11 and 12). In Northern Ireland, the smallest productivity effects are evident in paper and printing and chemicals with the most significant effects in machinery and equipment, electrical and optical equipment and wood products. In Ireland a broader group of sectors exhibit relatively low productivity sensitivity to materials cost increases including – chemicals, mineral products, metals and products, machinery and equipment and transport equipment. The greatest productivity sensitivity is evident in food, leather and wood products (Table 12).

Productivity provides a key measure of firms' ability to generate wealth and is therefore a central measure of policy interest. From a corporate point of view, however, a more telling indicator of business success and viability is profitability. In section 5 we therefore focus on the impact of cost changes on profitability.

5. Cost Pressures and Profitability

In this section we examine the impact of cost changes on profitability at the level of the individual sector. In particular, we examine the impact on profitability of 10 per cent increases in material costs, labour costs and capital costs. Similar effects might be anticipated from other items of similar importance in firms' cost-base. Two factors shape the profitability effect of any cost increase: the importance of the item in a firm's cost bundle, and the initial level of profitability. The effect of any cost increase will be greatest where the item is important within the firm's budget and initial profit rates are low.

For example, materials purchases account for 54.2 per cent of the sales of all firms in Ireland (Table 9) with an initial profit margin of 6.5 per cent on sales. A 10 per cent price increase for materials – *ceteris paribus* – would reduce profits by some 83.4 per cent. The same materials cost increase in Northern Ireland would have a smaller profit effect of 35 per cent primarily due to higher initial margins in Northern Ireland. Among externally-owned plants in Ireland the profit effect would be even lower given both their higher initial margins and lower material costs (Table 13).

In broad terms the most vulnerable group of firms to increasing cost pressures would seem to be Irish-owned firms in Ireland, primarily because of their low initial level of profitability. Both this group (-25.2 per cent), and to a lesser extent Northern Ireland firms (-12.2 per cent), are both notably more vulnerable to labour cost changes than externally-owned firms in Ireland (-2.3 per cent).

In terms of material costs a 10 per cent cost increase has an average profitability impact of 30-40 per cent. The largest effects are markedly higher than this, however, with the wood and wood products sector in both areas and the leather sector in Ireland each facing a loss. Low initial profit rates also mean that a 10 per cent materials cost increase also has substantial profitability effects in textiles (80.5 per cent) and machinery and equipment

(83.9 per cent) in Northern Ireland and textiles (89.5 per cent) and transport equipment (96.7 per cent) in Ireland. Notably smaller profitability impacts are evident in chemicals (25.1 per cent) and food (28.1 per cent) in Northern Ireland, and chemicals (-12.2 per cent) and paper and printing (-27.5 per cent) in Ireland.

Labour cost impacts on profitability average 12 per cent in Northern Ireland, and 4 per cent in Ireland (Table 10). The largest impacts – as with the material cost increases – tend to be in more traditional sectors: textiles and clothing (31.9 per cent) and wood and wood products (-30.4 per cent) in Northern Ireland and textiles (33.8 per cent), leather (48.2 per cent), metals and transport equipment (39.5 per cent) in Ireland. Notably smaller labour cost effects are evident in chemicals and food.

Capital cost effects are in general smaller due to the lesser importance of capital as a cost item (Tables 14 and 15). In Northern Ireland a 10 per cent capital cost increase would reduce profitability by 3.1 per cent (1.6 per cent in Ireland). Again the greatest sensitivity to cost increases is in more traditional sectors – wood and wood products (8.8 per cent) and minerals and metals (8.6 per cent) in Northern Ireland and leather (16.2 per cent), wood products (7.8 per cent) and transport equipment (9.4 per cent) in Ireland.

6. Discussion and Policy Implications

Our analysis has again suggested the marked differences in operating circumstances in different manufacturing sectors, and highlighted the key cost pressure points in Ireland and Northern Ireland. We are limited somewhat in the discussion by the lack of separate data for Northern Ireland-owned and externally-owned firms in Northern Ireland.

In Ireland, lower margins among Irish-owned firms make this group of firms markedly more cost-sensitive than externally-owned firms. This reflects comments made earlier relating to the differential productivity of Irish-owned and externally-owned enterprises in Ireland (e.g. Birnie and Hitchens, 1998).

Sectoral contrasts are also evident, however, with – as expected – traditional industries such as textiles, metals, minerals and wood products being most cost sensitive. In Northern Ireland, a similar pattern is observed with cost sensitivity tending to be greatest in the traditional sectors. Some interesting North-South differences are observed, however, with the Paper and Printing sector, for example, having a much greater sensitivity to labour costs in Northern Ireland than in Ireland.

The overall message for policy is unsurprising – that cost pressures will impact most directly on traditional sectors. What is surprising perhaps is the *extent* of the difference in impact of similar cost changes on different sectors. A 10 per cent increase in materials, for example, would reduce profitability in textiles in Ireland and Northern Ireland by over 80 per cent, around twice the average profitability effect for all manufacturing firms. Similarly, labour cost increases would have around three times as great an effect on profitability in textiles as the manufacturing average. Another implication of these results is clearly that in traditional sectors offshoring to reduce costs can have substantial profitability benefits.

Two types of policy implications stem from our analysis. First, it is clear that at a macro-economic level increasing cost pressures – be they from labour costs, energy costs or materials – do threaten the potential vulnerability of some sectors of industry in Ireland and Northern Ireland. Concerns about the impact of cost rises – such as those noted earlier in relation to labour costs – are therefore clearly valid. It is important to acknowledge the contingency of such effects, however, i.e. they matter much more in some sectors than others. Second, at a more micro-economic level, our analysis highlights those sectors where current profitability is low, and therefore where the impact of cost pressures on viability is likely to be greatest. For firms in these sectors – and agencies seeking to support them – innovation in products or business models are likely to be important elements of any long-term business strategy. Roche (1999), for example, discusses the potential for broadening the use of high-performance work systems while McAdam and Duffer (1996) focus on the use of TPM approaches to maximising capital utilisation.

7. Implications for the All Island Business Model

As currently conceived the AIBM will operate as a series of linked spreadsheets modelling the impact of market, policy and strategy changes on the growth and development of representative companies. Our analysis here has clearly demonstrated the significant differences in profitability impact of cost changes between sectors and ownership groups and provides some justification for this overall design.

A key decision in the overall architecture of the AIBM was whether to model separately the impact of policy changes on locally and externally-owned firms. This is not possible in Northern Ireland due to confidentiality restrictions. In Ireland it is possible, however, and is clearly of value given the very different cost sensitivity of the externally-owned and locally-owned sectors.

Our analysis here has therefore been important in shaping the basic architecture of the AIBM. It has also provided a crucial informational input as baseline projections for the AIBM will be based around the cost breakdowns in Annex 2 and 3 for firms in each sector and sizeband, and policy impacts will be measured from this starting point.

TABLE 1: Real GVA Per Employee for Northern Ireland and Republic of Ireland Industries: 1998-2000 in Constant Year €2000

	Republic of 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 Equip Nes	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 Nes	48.1	46.2	73.5	41.1	41.4	51.7
Radio, Television And Comms.	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 Nes	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

Source: O'Malley and Roper, 2003, Table 14.

Table 2: Innovation Activity in Ireland and Northern Ireland, 2000-2002, by sector, size and ownership

	Innovators (%)	Product Innovators (%)	Process Innovators (%)	Product Innovation Intensity (%) <i>median value</i>	Plants with New to Market Products (% of all plants)
AISI	70.60	55.40	52.60	25.00	46.30
Ireland	71.95	56.66	53.85	30.00	47.22
Northern Ireland	68.72	53.79	50.12	25.00	44.28
Industrial Sector					
Food, Drink & Tobacco	70.74	62.44	52.01	20.00	50.53
Textiles & Clothing	73.11	63.38	52.88	32.40	58.25
Wood and Wood Products	71.35	59.31	58.64	16.00	48.42
Paper and Printing	65.91	34.02	51.12	40.00	22.07
Chemicals	84.29	71.11	60.29	16.67	59.48
Metals & Metal Fabrication	61.93	40.87	46.89	30.77	30.95
Mechanical Engineering	71.21	63.34	52.62	40.00	61.08
Electrical & Optical Equipment	79.37	63.79	61.41	25.00	53.72
Transport Equipment	80.45	66.27	68.39	69.23	46.15
Other Manufacturing	75.48	60.53	51.90	25.00	53.11
Sizeband					
10-19	57.60	43.59	39.89	33.33	33.11
20-99	73.41	56.56	53.44	25.00	48.95
100+	89.73	76.67	75.32	23.28	64.32
Ownership					
Locally Owned	67.99	53.05	50.15	25.00	45.32
Foreign Owned	82.85	66.54	62.65	25.00	50.40

Notes and Source:

xx.xx denotes values above the average for all plants.

Product Innovation Intensity is calculated as the number of new products introduced in the previous 3 years as a proportion of the total number of products sold by the plant.

Data is derived from the IIP (see Annex 1 or www.innlab.org)

Table 3: Investment Rates in Ireland and Other EU Countries

	1994	1995	1996	1997	1998	1999	2000	2001
Part A: Investment per employee								
Belgium						12.8	12.9	12.5
Germany		6.9	7.3	7.3	7.6	7.9		
Greece	0	0	10					
Spain	0	2.8	3.2	3.2	3.6	4.4	6.9	7.6
Ireland			9.2	10.8	13.1	14.8	12.9	
Italy	10.0	5.9	8	6.5	7.1	7.1	8	7.9
Austria	7.8			7.8	8.2	8.8	10.7	10.7
Portugal	3.6	3.3				5.1	6.2	5.6
Finland	6.3	10.4	11	11.7	10.3	9.1	9	
Sweden	6.8		11.4				10.5	9.9
UK	4.9	5.6						8.6
Part B: Investment as Percentage of GVA								
Belgium						20.7	19.7	19.2
Germany		13.7	14	13.7	13.9	14.2		
Greece	20.6	24.3	22.2					
Spain	12.9	8.7	9.5	9.2	10.1	11.9	17.7	19.4
Ireland			13.2	13.0	15.0	13.5	9.8	
Italy	12.4	17.1	20.8	16.8	18.1	18.1	19	18.9
Austria	15.4			14.9	13.9	15	17.6	17.7
Portugal						28.8	32	28.5
Finland	12.3	19.5	20.9	20.7	17.4	14.8	12.8	
Sweden	13.6		21.2				15.8	17.8
UK	12.6	14.3						14

Source: Eurostat

Table 4: Net Capital Expenditure in UK Regions: 2001

	Per person employed £	% of GVA
United Kingdom	4,210	11.3
North East	7,291	20.6
North West	4,231	10.5
Yorkshire and the Humber	3,638	11.0
East Midlands	3,469	10.2
West Midlands	3,788	11.2
East	4,220	11.7
London	3,262	6.7
South East	4,248	10.0
South West	4,800	13.8
England	4,133	11.0
Wales	4,427	12.6
Scotland	4,830	13.3
Northern Ireland	4,390	11.4

Source: Regional Trends 2004, table 13.5, Based on ABI data.

Table 5: Revenue and Cost Structure of NI Manufacturing: 1998-2002

	1998	1999	2000	2001	2002	Average
Sales in (% sales):						
Northern Ireland	26.1	22.5	20.7	20.9	22.0	22.3
Great Britain	37.6	35.2	37.7	33.2	33.0	35.4
Ireland	8.6	7.4	7.4	8.3	8.8	8.1
Other EU Countries	13.1	13.7	13.8	16.0	15.1	14.3
Outside the EU	14.7	21.2	20.4	21.7	21.1	19.9
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0
Of which:						
Materials (% sales)	52.2	51.1	53.7	51.2	50.2	51.6
Other Purchases (% sales)	12.0	13.0	11.6	11.8	11.0	11.8
Gross Value Added (% sales)	35.4	39.3	36.5	36.8	38.4	37.3
Labour Cost (% sales)	18.8	17.9	17.3	17.9	18.3	18.0
Capital Expenditure (Net, % sales)	7.0	4.3	4.7	4.1	3.5	4.6
Profit (% sales)	9.6	17.1	14.5	14.8	16.6	14.7
R&D Expenditure (% sales)		1.1		1.6	1.6	1.4

Table 6: Sales Distribution and Cost Structure of Manufacturing in Ireland 2000-2002: By Nationality

	Irish-owned	Foreign-owned	Total
Percentage of Sales in:-			
Ireland	64.5	7.1	18.9
UK	15.9	14.1	14.4
Other EU	10.6	47.9	40.2
USA	4.3	14.3	12.3
Elsewhere	4.7	16.6	14.2
Total Sales	100.0	100.0	100.0
Of Which:-			
Materials	54.2	30.6	36.2
Other purchases	19.5	33.8	30.4
Gross Value Added	26.9	35.5	33.9
Labour costs	16.4	5.9	8.1
Net capital expenditure	4.0	3.8	3.6
Profit	6.5	25.9	22.2

Table 7: Revenue and Cost Structure of Northern Ireland Manufacturing 1998-2002: By Sector

	Food, drink	Textiles, clothing	Wood and products	Paper, printing	Chemicals	Rubber, plastics	Minerals, metals	Machinery, Equipment	Electrical and Optical	Transport Equipment	Other manufacturing	All Manufacturing
Sales in:												
Northern Ireland	33.7	8.9	50.9	56.6	14.0	20.4	52.4	7.2	3.9	4.4	31.0	22.3
Great Britain	45.0	62.9	21.7	20.3	15.6	31.9	18.0	38.6	31.5	29.4	30.3	35.4
Ireland	8.5	8.6	26.6	17.5	6.6	13.8	17.2	3.2	2.6	2.9	11.3	8.1
Other EU												
Countries	9.5	10.4	0.3	2.7	47.9	15.9	7.1	23.6	18.9	11.6	10.5	14.3
Outside the EU	3.3	9.2	0.4	3.0	16.0	18.0	5.2	27.4	43.1	51.7	16.9	19.9
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of which:												
Materials	54.5	51.7	56.8	35.0	39.0	48.1	39.6	57.8	62.2	46.5	49.0	51.6
Other Purchases	8.9	12.7	16.5	16.0	14.0	13.5	19.9	11.8	7.8	14.5	17.8	11.8
Gross Value Added	63.4	64.4										
	36.7	36.1	27.5	49.1	48.1	38.7	41.3	29.1	30.8	43.0	33.7	37.3
Labour Cost	11.2	25.5	17.0	27.5	15.9	23.3	23.3	18.3	14.1	27.2	20.2	18.0
Capital Expenditure (Net)	3.0	2.6	4.9	5.3	11.1	5.8	8.3	2.5	6.3	3.0	4.4	4.6
Profit	22.6	8.0	5.6	16.2	21.1	9.6	9.7	8.3	10.3	12.7	9.1	14.7
R&D Expenditure	0.2	1.4	0.3	2.0	3.5	2.1	2.4	8.6	5.0	0.6	5.5	1.4

Table 8: Sales Distribution and Cost Structure of Manufacturing in Ireland 2000-2002: By Sector

	Food, drink, tobacco	Textiles, clothing	Leather, footwear	Wood and products	Paper, printing	Chemicals	Rubber, plastics	Mineral products	Metals and products	Machinery, equipment	Electrical and optical	Transport equipment	Other manufac- turing	Total
Percentage of Sales in:-														
Ireland	44.3	30.6	17.1	68.3	17.8	3.7	53.3	75.5	53.1	27.7	8.2	27.8	51.8	18.9
UK	18.5	25.6	19.7	22.1	17.7	6.7	22.1	8.3	18.8	17.5	17.2	8.1	15.4	14.4
Other EU	23.7	30.1	40.8	6.3	54.5	51.3	20.5	8.1	18.8	34.3	40.8	47.2	17.5	40.2
USA	1.6	5.5	6.9	1.2	2.8	15.4	1.3	6.9	3.1	8.0	20.9	10.7	6.3	12.3
Elsewhere	11.8	8.0	15.5	2.3	7.1	22.9	2.7	1.3	6.1	12.6	12.9	6.1	9.0	14.2
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-														
Materials	43.0	40.2	58.0	52.2	15.0	17.0	47.5	35.8	49.1	49.1	52.5	46.2	48.2	36.2
Other purchases	30.6	25.1	21.0	20.0	51.0	34.4	16.1	23.0	14.5	14.3	24.5	15.7	15.6	30.4
Gross Value Added	26.9	35.1	21.3	28.2	34.2	49.6	37.0	41.9	37.1	36.9	23.2	37.7	36.7	33.9
Labour costs	8.6	24.7	18.8	16.9	8.1	3.7	21.5	21.0	24.7	23.3	6.7	25.3	17.2	8.1
Net capital expenditure	2.4	3.2	6.3	5.0	2.1	3.8	5.5	6.8	4.3	3.6	4.3	6.0	4.2	3.6
Profit	15.9	7.3	-3.9	6.4	24.0	42.0	10.0	14.1	8.1	10.0	12.2	6.4	15.4	22.2

**Table 9: Revenue and Cost Structure of Northern Ireland Manufacturing
1998-2002: By Sizeband**

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	60.2	33.9	12.2	22.3
Great Britain	17.5	33.4	38.7	35.4
Ireland	15.0	12.2	5.4	8.1
Other EU Countries	4.4	11.9	16.7	14.3
Outside the EU	3.0	8.6	27.0	19.9
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	50.4	57.0	49.7	51.6
Other Purchases (% sales)	14.7	14.9	10.1	11.8
Gross Value Added (% sales)	34.8	28.7	41.2	37.3
Labour Cost (% sales)	20.2	18.4	17.5	18.0
Capital Expenditure (Net, % sales)	4.2	5.1	4.5	4.6
Profit (% sales)	10.5	5.2	19.2	14.7
R&D Expenditure (% sales)	6.4	2.3	1.3	1.4

Table 10: Productivity (GVA) Impact of Materials Cost Increase

	NI	Irish-owned	Foreign-owned	Total
Materials and Other Inputs (% sales)	63.4	73.7	64.4	66.6
Gross Value Added (% sales)	37.3	26.9	35.5	33.9
GVA Impact of 10% materials cost increase	-17.0	-27.4	-18.1	-19.6

**Table 11: Productivity Impact of Materials Cost Changes:
Northern Ireland**

	Materials and Other Inputs (% sales)	Gross Value Added (% sales)	GVA Impact of 10% materials cost increase
Food, drink	63.4	36.7	-17.3
Textiles, clothing	64.4	36.1	-17.8
Wood and products	73.3	27.5	-26.7
Paper, printing	51	49.1	-10.4
Chemicals	53	48.1	-11.0
Rubber, plastics	61.6	38.7	-15.9
Minerals, metals	59.5	41.3	-14.4
Machinery, Equipment	69.6	29.1	-23.9
Electrical and Optical	70	30.8	-22.7
Transport Equipment	61	43	-14.2
Other manufacturing	66.8	33.7	-19.8
All Manufacturing	63.4	37.3	-17.0

Table 12: Productivity Impact of Materials Cost Changes: Ireland

	Materials and Other Inputs (% sales)	Gross Value Added (% sales)	GVA Impact of 10% materials cost increase
Food, drink, tobacco	73.6	26.9	-27.36
Textiles, clothing	65.3	35.1	-18.60
Leather, footwear	79	21.3	-37.09
Wood and products	72.2	28.2	-25.60
Paper, printing	66	34.2	-19.30
Chemicals	51.4	49.6	-10.36
Rubber, plastics	63.6	37	-17.19
Mineral products	58.8	41.9	-14.03
Metals and products	63.6	37.1	-17.14
Machinery, equipment	63.4	36.9	-17.18
Electrical and optical	77	23.2	-33.19
Transport equipment	61.9	37.7	-16.42
Other manufacturing	63.8	36.7	-17.38
Total	66.6	33.9	-19.65

Table 13: Profitability Impacts of Cost Changes: NI and Ireland

	NI	Irish-owned	Foreign-owned	Total
Costs as % of Sales				
Materials and Purchases	63.4	73.7	64.4	66.6
Materials (% sales)	51.6	54.2	30.6	36.2
Other Purchases (% sales)	11.8	19.5	33.8	30.4
Gross Value Added (% sales)	37.3	26.9	35.5	33.9
Labour Cost (% sales)	18	16.4	5.9	8.1
Capital Expenditure (Net, % sales)	4.6	4	3.8	3.6
Profit (% sales)	14.7	6.5	25.9	22.2
Profit Impacts of 10 per cent cost increase (%)				
Materials and Purchases	-43.1	-113.4	-24.9	-30.0
Materials (% sales)	-35.1	-83.4	-11.8	-16.3
Other Purchases (% sales)	-8.0	-30.0	-13.1	-13.7
Gross Value Added (% sales)	-25.4	-41.4	-13.7	-15.3
Labour Cost (% sales)	-12.2	-25.2	-2.3	-3.6
Capital Expenditure (Net, % sales)	-3.1	-6.2	-1.5	-1.6

Table 14: Profitability Impacts of Cost Changes: Northern Ireland Sectors

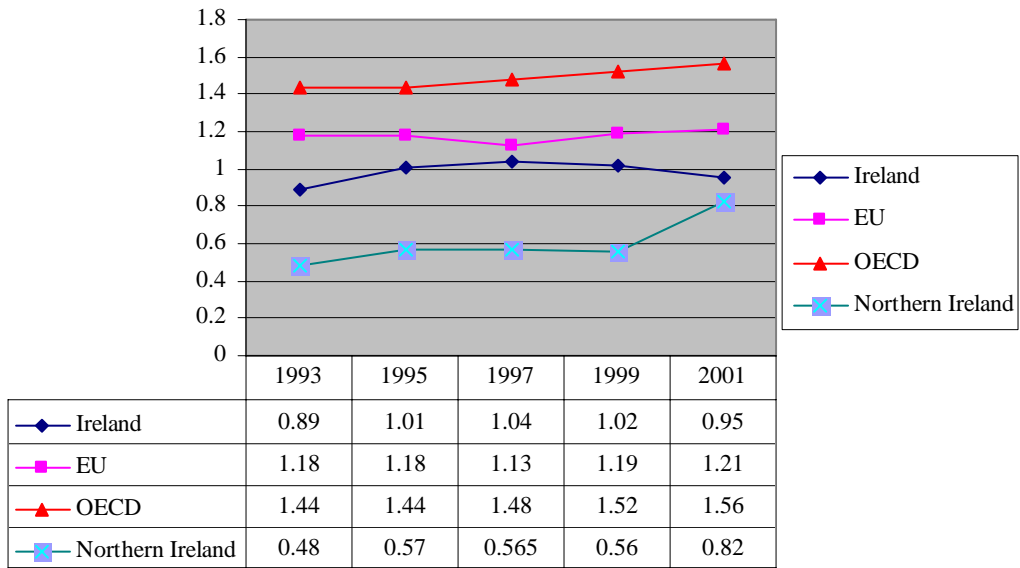
	Food, drink	Textiles, clothing	Wood and products	Paper, printing	Chemica ls	Rubber, plastics	Minerals , metals	Machine ry, Equipme nt	Electrica l and Optical	Transpor t Equipme nt	Other manufac turing	All Manufac t
Costs as % of Sales												
Materials and Purchases	63.4	64.4	73.3	51	53	61.6	59.5	69.6	70	61	66.8	63.4
Materials	54.5	51.7	56.8	35	39	48.1	39.6	57.8	62.2	46.5	49	51.6
Other Purchases	8.9	12.7	16.5	16	14	13.5	19.9	11.8	7.8	14.5	17.8	11.8
Labour Cost	11.2	25.5	17	27.5	15.9	23.3	23.3	18.3	14.1	27.2	20.2	18
Capital Expenditure (Net)	3	2.6	4.9	5.3	11.1	5.8	8.3	2.5	6.3	3	4.4	4.6
Profit	22.6	8	5.6	16.2	21.1	9.6	9.7	8.3	10.3	12.7	9.1	14.7
Profit Impacts of 10 per cent cost increase (%)												
Materials and Purchases	-28.1	-80.5	-130.9	-31.5	-25.1	-64.2	-61.3	-83.9	-68.0	-48.0	-73.4	-43.1
Materials	-24.1	-64.6	-101.4	-21.6	-18.5	-50.1	-40.8	-69.6	-60.4	-36.6	-53.8	-35.1
Other Purchases	-3.9	-15.9	-29.5	-9.9	-6.6	-14.1	-20.5	-14.2	-7.6	-11.4	-19.6	-8.0
Labour Cost	-5.0	-31.9	-30.4	-17.0	-7.5	-24.3	-24.0	-22.0	-13.7	-21.4	-22.2	-12.2
Capital Expenditure (Net)	-1.3	-3.3	-8.8	-3.3	-5.3	-6.0	-8.6	-3.0	-6.1	-2.4	-4.8	-3.1

Table 15: Profitability Impacts of Cost Changes: Ireland Sectors

	Food, drink, tobacco	Textiles, clothing	Leather, footwear	Wood and products	Paper, printing	Chemicals	Rubber, plastics	Mineral products	Metals and products	Machiner y, equipme nt	Electrica l and optical	Transport equipment	Other manufa c-turing	Total
Costs as % of Sales														
Materials and Purchases	73.6	65.3	79	72.2	66	51.4	63.6	58.8	63.6	63.4	77	61.9	63.8	66.6
Materials	43	40.2	58	52.2	15	17	47.5	35.8	49.1	49.1	52.5	46.2	48.2	36.2
Other Purchases	30.6	25.1	21	20	51	34.4	16.1	23	14.5	14.3	24.5	15.7	15.6	30.4
Labour Cost	8.6	24.7	18.8	16.9	8.1	3.7	21.5	21	24.7	23.3	6.7	25.3	17.2	8.1
Capital Expenditure (Net)	2.4	3.2	6.3	5	2.1	3.8	5.5	6.8	4.3	3.6	4.3	6	4.2	3.6
Profit	15.9	7.3	-3.9	6.4	24	42	10	14.1	8.1	10	12.2	6.4	15.4	22.2
Profit Impacts of 10 per cent cost increase (%)														
Materials and Purchases	-46.3	-89.5	202.6	-112.8	-27.5	-12.2	-63.6	-41.7	-78.5	-63.4	-63.1	-96.7	-41.4	-30.0
Materials	-27.0	-55.1	148.7	-81.6	-6.3	-4.0	-47.5	-25.4	-60.6	-49.1	-43.0	-72.2	-31.3	-16.3
Other Purchases	-19.2	-34.4	53.8	-31.3	-21.3	-8.2	-16.1	-16.3	-17.9	-14.3	-20.1	-24.5	-10.1	-13.7
Labour Cost	-5.4	-33.8	48.2	-26.4	-3.4	-0.9	-21.5	-14.9	-30.5	-23.3	-5.5	-39.5	-11.2	-3.6
Capital Expenditure (Net)	-1.5	-4.4	16.2	-7.8	-0.9	-0.9	-5.5	-4.8	-5.3	-3.6	-3.5	-9.4	-2.7	-1.6

Figure 2

Business Expenditure on R&D as % of GDP/GNP - Ireland, EU and OECD, 1993 to 2001



Notes: BERD as a percentage of GDP in 1997 for Northern Ireland is estimated.

Annex 1: Data Sources

A1.1 Northern Ireland

Data for Northern Ireland from 1998-2002 was compiled from a series of data files provided by DETI specifically for the All Island Business Model project. In terms of productivity the key data source was the Northern Ireland ABI for which establishment level data was made available.

The Northern Ireland Annual Business Inquiry (NIABI) covers all manufacturing businesses employing twenty or more employees as well as a random sample of smaller firms. Sampling is from the Inter Departmental Business Register (IDBR).

For the analysis, pooled data for the 1998-2002 period was analysed by sector and it was therefore necessary to deflate values to a common price level. Industry specific producer price deflators were used taken from the Monthly Digest of Statistics, October 2004, Table 18.9. In each case values are quoted at year 2000 prices.

Pooling data across the 1998-2002 period also raised some issues in terms of defining GVA at market prices. Standardly, this is derived as¹³:

Total turnover + insurance claims + change in stocks + own account capex – total purchases.

However, there is no information on insurance claims for the 1998-2000 period, and these are therefore excluded from the analysis. Also, the turnover information provided for two tobacco companies in Northern Ireland (Gallaghers and Murrays) included excise duties. Information on the scale of these duties was available for 2001 and 2002 only. These were pro-rated backwards to exclude duty from earlier turnover figures for these two firms.

For the tables, deflated data for the 1998-2002 period (i.e. 5 years) was aggregated by firm size (at the start of the period) and 2-digit industrial sector. Detailed results are included in Annex 2.

A1.2 Ireland

The data for Ireland are from the annual *Census of Industrial Production*. We are grateful to the Central Statistics Office for providing some unpublished details from the census. The *Census of Industrial Production* covers all enterprises or local units that have three or more persons engaged and that are wholly or principally involved in industrial production. Data for any non-respondents are fully estimated by the CSO.

¹³ I am grateful to Claire Lyle at DETINI for providing these details

The percentage figures in our tables are generally the average of three years, 2000-2002. Where data are not available for certain categories of industry in one of those years, the percentage figures in the tables are the average for two of those years.

In the *Census of Industrial Production*, data for turnover and gross value-added include excise duty, but we have deducted any excise duty to arrive at our figures for sales and gross value-added. Our figures for net capital expenditure are derived by subtracting sales of capital assets from total additions to capital assets. We define profit as gross value-added (excluding excise duty) minus total labour costs minus net capital expenditure.

Annex 2: Detailed Sectoral Tables for Northern Ireland

Table A2.1: Food Drink and Tobacco (Nace 15-16)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	60.7	41.6	26.3	33.7
Great Britain	21.8	36.2	52.3	45.0
Ireland	13.7	9.2	7.4	8.5
Other EU Countries	3.4	9.4	10.4	9.5
Outside the EU	0.3	3.6	3.6	3.3
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	62.1	72.1	45.7	54.5
Other Purchases (% sales)	11.8	10.9	7.5	8.9
Gross Value Added (% sales)	25.8	17.7	46.8	36.7
Labour Cost (% sales)	11.1	10.4	11.5	11.2
Capital Expenditure (Net, % sales)	11.1	10.4	11.5	11.2
Profit (% sales)	11.1	4.2	32.4	22.6
R&D Expenditure (% sales)	0.8	0.8	0.1	0.2

Table A2.2: Textiles, clothing (Nace 17-19)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	34.4	8.8	5.4	8.9
Great Britain	32.7	58.8	70.0	62.9
Ireland	12.5	6.1	9.7	8.6
Other EU Countries	13.8	12.8	8.2	10.4
Outside the EU	6.6	13.4	6.7	9.2
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	50.1	53.9	50.6	51.7
Other Purchases (% sales)	14.1	14.9	11.1	12.7
Gross Value Added (% sales)	34.1	32.0	38.8	36.1
Labour Cost (% sales)	24.7	24.3	26.4	25.5
Capital Expenditure (Net, % sales)	24.7	24.3	26.4	25.5
Profit (% sales)	8.3	4.4	10.1	8.0
R&D Expenditure (% sales)	1.6	1.2	1.5	1.4

Table A2.3: Wood and products (Nace 20)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	67.1	48.9	20.0	50.9
Great Britain	7.7	22.3	51.5	21.7
Ireland	23.8	28.5	28.5	26.6
Other EU Countries	0.5	0.2	0.0	0.3
Outside the EU	1.0	0.1	0.0	0.4
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	56.0	55.4	61.4	56.8
Other Purchases (% sales)	13.7	17.8	19.8	16.5
Gross Value Added (% sales)	31.0	27.2	20.9	27.5
Labour Cost (% sales)	17.5	17.0	15.9	17.0
Capital Expenditure (Net, % sales)	17.5	17.0	15.9	17.0
Profit (% sales)	10.0	5.7	-3.7	5.6
R&D Expenditure (% sales)	3.6	0.7	0.2	0.3

Table A2.4: Paper and Printing (Nace 21-22)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	73.8	40.4	70.3	56.6
Great Britain	9.7	28.1	14.8	20.3
Ireland	15.8	22.7	11.1	17.5
Other EU Countries	0.4	5.4	0.0	2.7
Outside the EU	0.3	3.5	3.7	3.0
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	34.6	41.0	26.0	35.0
Other Purchases (% sales)	16.3	15.6	16.4	16.0
Gross Value Added (% sales)	49.0	43.5	57.9	49.1
Labour Cost (% sales)	29.3	26.6	27.7	27.5
Capital Expenditure (Net, % sales)	29.3	26.6	27.7	27.5
Profit (% sales)	14.4	10.0	27.2	16.2
R&D Expenditure (% sales)	#DIV/0!	1.3	#DIV/0!	2.0

Table A2.5: Chemicals (Nace 24)

	Employee Sizeband			All
	Less than 50	50 -200	200 plus	Enterprises
Sales in (% sales):				
Northern Ireland	61.6	37.9	5.1	14.0
Great Britain	10.5	16.8	16.0	15.6
Ireland	16.2	17.1	3.9	6.6
Other EU Countries	3.1	18.1	57.3	47.9
Outside the EU	8.6	10.1	17.7	16.0
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	50.2	47.7	35.8	39.0
Other Purchases (% sales)	20.2	18.2	12.4	14.0
Gross Value Added (% sales)	29.0	32.9	53.6	48.1
Labour Cost (% sales)	13.0	22.1	15.4	15.9
Capital Expenditure (Net, % sales)	13.0	22.1	15.4	15.9
Profit (% sales)	12.0	-8.8	27.3	21.1
R&D Expenditure (% sales)	2.4	1.6	3.7	3.5

Table A2.6: Rubber and Plastics (Nace 25)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	52.9	29.3	5.2	20.4
Great Britain	25.5	39.0	26.2	31.9
Ireland	16.4	19.1	8.0	13.8
Other EU Countries	1.1	8.7	26.0	15.9
Outside the EU	4.1	3.8	34.7	18.0
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	46.8	49.3	47.1	48.1
Other Purchases (% sales)	15.0	15.1	11.4	13.5
Gross Value Added (% sales)	38.8	36.0	41.5	38.7
Labour Cost (% sales)	25.6	21.1	24.9	23.3
Capital Expenditure (Net, % sales)	25.6	21.1	24.9	23.3
Profit (% sales)	8.5	9.3	10.3	9.6
R&D Expenditure (% sales)	3.5	2.6	0.5	2.1

Table A2.7: Minerals, metals (Nace 26-28)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	66.7	60.0	30.8	52.4
Great Britain	14.8	17.4	21.1	18.0
Ireland	13.8	16.4	20.7	17.2
Other EU Countries	3.3	4.6	13.8	7.1
Outside the EU	1.4	1.7	13.5	5.2
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	43.6	40.7	34.6	39.6
Other Purchases (% sales)	17.3	20.2	21.9	19.9
Gross Value Added (% sales)	39.8	39.7	45.0	41.3
Labour Cost (% sales)	23.6	24.2	21.8	23.3
Capital Expenditure (Net, % sales)	23.6	24.2	21.8	23.3
Profit (% sales)	11.1	7.7	11.3	9.7
R&D Expenditure (% sales)	2.6	1.9	3.4	2.4

Table A2.8: Machinery, Equipment (Nace 29)

	Employee Sizeband			All
	Less than 50	50 -200	200 plus	Enterprises
Sales in (% sales):				
Northern Ireland	61.8	5.3	0.2	7.2
Great Britain	14.4	28.9	46.5	38.6
Ireland	16.2	4.2	0.8	3.2
Other EU Countries	4.4	25.1	25.7	23.6
Outside the EU	3.2	36.5	26.9	27.4
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	46.2	53.4	62.1	57.8
Other Purchases (% sales)	14.0	17.4	8.7	11.8
Gross Value Added (% sales)	40.1	28.9	27.0	29.1
Labour Cost (% sales)	26.5	16.3	17.6	18.3
Capital Expenditure (Net, % sales)	26.5	16.3	17.6	18.3
Profit (% sales)	9.5	10.2	7.3	8.3
R&D Expenditure (% sales)	10.3	1.2	13.4	8.6

Table A2.9: Electrical and Optical (Nace 30-33)

	Employee Sizeband			All
	Less than 50	50 -200	200 plus	Enterprises
Sales in (% sales):				
Northern Ireland	31.9	13.1	1.8	3.9
Great Britain	24.0	19.4	33.4	31.5
Ireland	8.2	2.9	2.4	2.6
Other EU Countries	15.3	34.9	16.7	18.9
Outside the EU	20.6	29.8	45.7	43.1
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	40.3	61.8	63.2	62.2
Other Purchases (% sales)	12.6	16.8	6.4	7.8
Gross Value Added (% sales)	46.8	23.6	31.1	30.8
Labour Cost (% sales)	32.8	21.3	12.4	14.1
Capital Expenditure (Net, % sales)	32.8	21.3	12.4	14.1
Profit (% sales)	9.7	-5.7	12.5	10.3
R&D Expenditure (% sales)	33.3	16.2	4.3	5.0

Table A2.10: Transport Engineering (Nace 34-35)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	47.7	23.7	1.9	4.4
Great Britain	12.5	57.3	28.2	29.4
Ireland	17.4	14.7	1.7	2.9
Other EU Countries	15.6	4.0	11.9	11.6
Outside the EU	6.8	0.3	56.3	51.7
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	51.3	54.6	45.8	46.5
Other Purchases (% sales)	15.2	14.2	14.5	14.5
Gross Value Added (% sales)	31.9	33.1	44.0	43.0
Labour Cost (% sales)	24.8	23.2	27.6	27.2
Capital Expenditure (Net, % sales)	24.8	23.2	27.6	27.2
Profit (% sales)	1.7	8.4	13.4	12.8
R&D Expenditure (% sales)	6.1	3.7	0.6	0.6

Table A2.11: Other manufacturing (Nace 23,36-37)

	Employee Sizeband			All Enterprises
	Less than 50	50 -200	200 plus	
Sales in (% sales):				
Northern Ireland	67.9	26.4	0.6	31.0
Great Britain	14.8	36.1	36.3	30.3
Ireland	13.4	15.5	1.9	11.3
Other EU Countries	2.9	18.1	5.2	10.5
Outside the EU	1.1	3.9	55.9	16.9
Total Sales	100.0	100.0	100.0	100.0
Of which:				
Materials (% sales)	48.0	49.1	50.6	49.0
Other Purchases (% sales)	16.6	16.9	21.2	17.8
Gross Value Added (% sales)	36.0	34.4	28.7	33.7
Labour Cost (% sales)	20.5	20.3	19.5	20.2
Capital Expenditure (Net, % sales)	20.5	20.3	19.5	20.2
Profit (% sales)	10.5	9.1	6.7	9.1
R&D Expenditure (% sales)	6.7	1.9	#DIV/0!	5.5

Annex 3: Detailed Tables for Ireland

Table A3.1: Food, Drink & Tobacco (NACE 15-16)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	75.8	56.4	57.8	56.6	24.7	31.8	44.3
UK	11.7	19.2	17.9	18.9	19.4	21.2	18.5
Other EU	7.6	16.0	12.2	19.0	37.4	31.3	23.7
USA	0.7	1.5	4.6	0.1	0.7	1.6	1.6
Elsewhere	4.2	6.8	7.5	5.4	17.8	14.0	11.8
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	63.1	57.9	68.8	50.0	30.4	15.5	43.0
Other purchases (% of sales)	16.7	26.8	14.7	14.0	36.6	44.7	30.6
Gross Value Added (% of sales)	20.8	15.4	17.0	36.1	33.7	40.3	26.9
Labour costs (% of sales)	10.9	8.8	10.7	8.6	7.4	7.2	8.6
Net capital expenditure (% of sales)	3.9	2.3	2.7	2.0	1.7	2.0	2.4
Profit (% of sales)	6.1	4.2	3.5	25.5	24.6	31.1	15.9

Table A3.2: Textiles & Clothing (NACE 17-18)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	53.6	34.0	63.9	33.0	10.0	7.1	30.6
UK	21.8	44.9	15.6	20.0	19.8	38.5	25.6
Other EU	11.3	9.9	6.0	34.0	51.9	52.6	30.1
USA	8.2	5.4	13.8	7.3	7.0	0.4	5.5
Elsewhere	5.1	5.8	0.7	5.6	11.3	1.3	8.0
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	38.0	47.4	47.6	36.3	47.8	30.4	40.2
Other purchases (% of sales)	27.7	19.2	21.4	25.5	13.2	35.0	25.1
Gross Value Added (% of sales)	33.4	35.2	30.8	33.5	42.7	34.5	35.1
Labour costs (% of sales)	26.1	28.7	29.5	28.4	24.9	18.2	24.7
Net capital expenditure (% of sales)	1.8	6.7	2.7	-2.8	2.4	3.9	3.2
Profit (% of sales)	5.5	-0.2	-1.4	7.9	15.3	12.4	7.3

Table A3.3: Leather & Leather Products (NACE 19)

	All Enterprises
Percentage of Sales in:-	
Ireland	17.1
UK	19.7
Other EU	40.8
USA	6.9
Elsewhere	15.5
Total Sales	100.0
Of Which:-	
Materials (% of sales)	58.0
Other purchases (% of sales)	21.0
Gross Value Added (% of sales)	21.3
Labour costs (% of sales)	18.8
Net capital expenditure (% of sales)	6.3
Profit (% of sales)	-3.9

Table A3.4: Wood & Wood Products (NACE 20)

Employment Sizeband	Irish-Owned		Foreign-Owned	All
	0-49	50-199	All	Enterprises
Percentage of Sales in:-				
Ireland	81.4	77.5	27.6	68.3
UK	13.5	21.2	44.9	22.1
Other EU	2.3	1.2	18.4	6.3
USA	1.5	0.0	1.0	1.2
Elsewhere	1.2	0.1	8.1	2.3
Total Sales	100.0	100.0	100.0	100.0
Of Which:-				
Materials (% of sales)	55.5	49.5	50.8	52.2
Other purchases (% of sales)	16.0	23.4	21.8	20.0
Gross Value Added (% of sales)	29.1	27.7	27.4	28.2
Labour costs (% of sales)	20.1	13.9	15.7	16.9
Net capital expenditure (% of sales)	2.9	5.0	8.0	5.0
Profit (% of sales)	6.1	8.8	3.8	6.4

Table A3.5: Paper, Publishing & Printing (NACE 21-22)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	84.9	79.5	87.2	20.5	16.2	2.3	17.8
UK	8.4	12.3	5.2	16.6	16.3	20.3	17.7
Other EU	3.8	4.2	1.5	58.0	47.5	67.4	54.5
USA	2.5	2.4	4.9	0.4	6.5	2.3	2.8
Elsewhere	0.5	1.6	1.3	4.6	13.5	7.7	7.1
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	36.4	41.5	18.3	25.9	16.6	12.1	15.0
Other purchases (% of sales)	19.2	18.3	30.7	38.4	40.7	60.8	51.0
Gross Value Added (% of sales)	44.4	40.9	50.8	35.7	42.3	27.6	34.2
Labour costs (% of sales)	29.5	30.3	28.2	13.7	9.5	2.8	8.1
Net capital expenditure (% of sales)	5.8	4.9	12.2	1.0	1.2	0.9	2.1
Profit (% of sales)	9.1	5.7	10.4	21.1	31.6	23.8	24.0

TableA3.6: Chemicals (NACE 24)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	77.3	54.8	34.3	35.0	8.2	1.6	3.7
UK	9.4	21.9	24.9	21.0	5.3	6.2	6.7
Other EU	9.1	14.1	24.4	35.0	40.2	54.7	51.3
USA	1.1	3.9	9.1	1.5	36.3	11.4	15.4
Elsewhere	3.0	5.2	7.2	7.5	9.9	26.2	22.9
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	53.3	56.8	43.1	44.2	34.3	12.6	17.0
Other purchases (% of sales)	25.2	17.0	24.1	23.4	24.0	36.8	34.4
Gross Value Added (% of sales)	24.0	26.8	31.4	36.9	42.8	51.2	49.6
Labour costs (% of sales)	14.2	14.0	19.8	10.9	5.7	2.9	3.7
Net capital expenditure (% of sales)	4.6	4.5	4.4	4.2	3.0	4.1	3.8
Profit (% of sales)	5.2	8.3	7.2	21.8	34.1	44.2	42.0

Table A3.7: Rubber & Plastic Products (NACE 25)

Employment Sizeband	All Nationalities			All
	0-49	50-199	200 plus	Enterprises
Percentage of Sales in:-				
Ireland	63.2	50.3	38.2	53.3
UK	18.6	23.5	25.7	22.1
Other EU	15.4	21.6	30.8	20.5
USA	1.4	1.1	2.0	1.3
Elsewhere	1.4	3.6	3.3	2.7
Total Sales	100.0	100.0	100.0	100.0
Of Which:-				
Materials (% of sales)	48.4	45.0	53.0	47.5
Other purchases (% of sales)	16.5	17.2	11.9	16.1
Gross Value Added (% of sales)	35.8	38.3	35.9	37.0
Labour costs (% of sales)	20.6	21.5	24.0	21.5
Net capital expenditure (% of sales)	5.6	6.1	3.3	5.5
Profit (% of sales)	9.6	10.6	8.6	10.0

Table A3.8: Non-Metallic Mineral Products (NACE 26)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	92.1	90.2	60.4	58.0	41.3	41.3	75.5
UK	3.6	7.5	9.3	10.1	17.9	17.9	8.3
Other EU	2.3	1.0	0.8	29.4	34.8	34.8	8.1
USA	1.2	1.0	27.6	0.0	4.0	4.0	6.9
Elsewhere	0.8	0.3	2.0	2.5	1.9	1.9	1.3
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	42.1	36.0	26.6	55.0	45.1	41.2	35.8
Other purchases (% of sales)	19.8	25.5	25.9	15.7	22.0	16.7	23.0
Gross Value Added (% of sales)	38.9	39.1	48.0	29.1	33.8	42.7	41.9
Labour costs (% of sales)	20.9	23.2	20.7	8.9	24.5	20.8	21.0
Net capital expenditure (% of sales)	7.5	9.0	6.8	19.1	1.9	1.5	6.8
Profit (% of sales)	10.6	6.8	20.4	1.0	7.4	20.4	14.1

Table A3.9 : Metals & Metal Products (NACE 27-28)

Employment Sizeband	Irish-Owned		Foreign-Owned		All
	0-49	50 plus	0-49	50 plus	Enterprises
Percentage of Sales in:-					
Ireland	79.9	70.1	36.8	8.8	53.1
UK	14.0	24.5	22.5	20.2	18.8
Other EU	4.0	2.6	27.5	50.6	18.8
USA	1.1	1.3	9.3	7.5	3.1
Elsewhere	1.0	1.5	3.9	13.0	6.1
Total Sales	100.0	100.0	100.0	100.0	100.0
Of Which:-					
Materials (% of sales)	46.5	46.4	55.3	53.2	49.1
Other purchases (% of sales)	15.3	17.5	12.0	12.5	14.5
Gross Value Added (% of sales)	38.4	35.6	33.4	36.0	37.1
Labour costs (% of sales)	25.6	28.3	19.6	23.5	24.7
Net capital expenditure (% of sales)	3.7	2.8	2.0	6.9	4.3
Profit (% of sales)	9.0	4.5	11.8	5.6	8.1

Table A3.10: Machinery & Equipment n.e.c.(NACE 29)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	71.6	48.7	23.3	9.7	9.7	3.0	27.7
UK	15.4	16.5	44.8	18.4	18.4	12.2	17.5
Other EU	7.1	21.1	22.5	46.9	46.9	49.1	34.3
USA	2.7	8.9	1.8	10.9	10.9	11.3	8.0
Elsewhere	3.2	4.7	7.7	14.1	14.1	24.4	12.6
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	43.7	55.2	48.7	49.0	51.8	47.9	49.1
Other purchases (% of sales)	17.7	14.6	8.4	20.1	12.6	13.3	14.3
Gross Value Added (% of sales)	39.4	30.8	43.2	30.3	35.7	38.8	36.9
Labour costs (% of sales)	28.2	23.0	27.5	22.6	21.0	21.3	23.3
Net capital expenditure (% of sales)	4.1	3.8	3.5	3.9	2.5	3.6	3.6
Profit (% of sales)	7.1	4.0	12.2	3.8	12.1	13.9	10.0

Table A3.11: Electrical, Electronic & Optical Equipment (NACE 30-33)

Employment Sizeband	Irish-Owned			Foreign-Owned			All Enterprises
	0-49	50- 199	200 plus	0-49	50- 199	200 plus	
Percentage of Sales in:-							
Ireland	54.6	30.6	42.6	15.5	17.5	5.3	8.2
UK	14.2	17.5	13.2	11.7	15.4	15.9	17.2
Other EU	16.9	16.6	23.7	55.5	46.5	39.5	40.8
USA	7.2	29.3	14.2	12.0	12.3	24.7	20.9
Elsewhere	7.1	6.1	6.2	5.3	8.3	14.7	12.9
Total Sales	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Of Which:-							
Materials (% of sales)	42.6	51.7	58.3	55.5	50.2	52.7	52.5
Other purchases (% of sales)	20.9	20.1	12.0	16.2	20.7	25.3	24.5
Gross Value Added (% of sales)	36.1	27.5	30.4	27.2	29.5	22.3	23.2
Labour costs (% of sales)	22.9	20.1	16.4	12.7	12.1	5.5	6.7
Net capital expenditure (% of sales)	3.5	3.1	2.6	3.6	2.1	4.5	4.3
Profit (% of sales)	9.7	4.4	11.4	11.0	15.4	12.3	12.2

Table A3.12: Transport Equipment (NACE 34-35)

Employment Sizeband	All Nationalities			All
	0-49	50-199	200 plus	Enterprises
Percentage of Sales in:-				
Ireland	57.7	28.3	22.7	27.8
UK	16.2	11.6	5.5	8.1
Other EU	16.8	32.6	57.5	47.2
USA	5.6	21.8	7.8	10.7
Elsewhere	3.7	5.7	6.5	6.1
Total Sales	100.0	100.0	100.0	100.0
Of Which:-				
Materials (% of sales)	55.2	48.5	43.8	46.2
Other purchases (% of sales)	12.5	12.6	17.2	15.7
Gross Value Added (% of sales)	31.8	42.0	37.5	37.7
Labour costs (% of sales)	24.3	24.8	25.7	25.3
Net capital expenditure (% of sales)	2.8	5.2	6.9	6.0
Profit (% of sales)	4.7	11.9	4.9	6.4

Table A3.13: Other Manufacturing (NACE 36-37, 23)

Employment Sizeband	All Nationalities			All
	0-49	50-199	200 plus	Enterprises
Percentage of Sales in:-				
Ireland	75.8	56.9	15.2	51.8
UK	13.0	19.3	12.4	15.4
Other EU	6.1	14.2	36.6	17.5
USA	2.3	6.8	9.7	6.3
Elsewhere	2.8	2.8	26.1	9.0
Total Sales	100.0	100.0	100.0	100.0
Of Which:-				
Materials (% of sales)	44.0	59.5	33.9	48.2
Other purchases (% of sales)	18.6	15.7	13.4	15.6
Gross Value Added (% of sales)	37.9	23.8	51.4	36.7
Labour costs (% of sales)	23.0	14.4	16.3	17.2
Net capital expenditure (% of sales)	3.9	5.8	3.6	4.2
Profit (% of sales)	10.9	3.6	31.5	15.4

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