

Department of Enterprise,
Trade and Investment

The Future Role of Manufacturing
in Northern Ireland

July 2005

Final Report



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“We find that the competitiveness agenda facing UK leaders in Government and business reflects the challenges of moving from a location competing on relatively low costs of doing business to a location competing on unique value and innovation”
(Porters and Ketels, DTI, 2004)

I Executive Summary

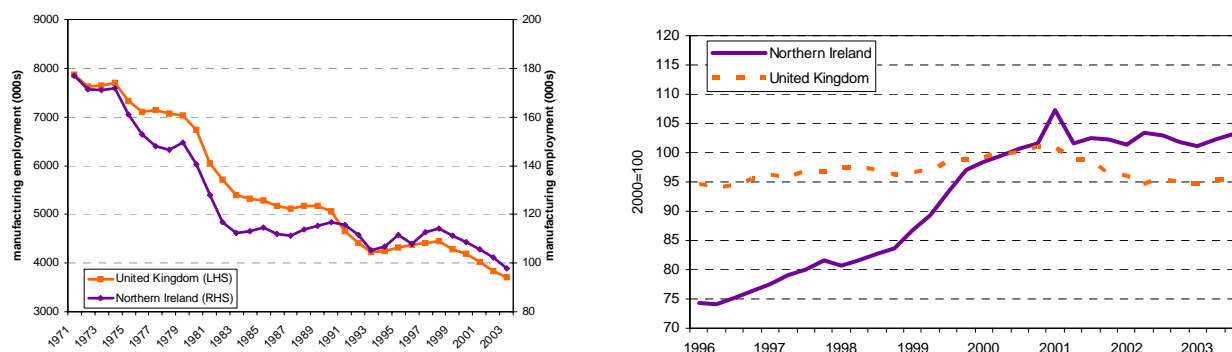
Introduction

1.1 Manufacturing has been an important part of the economy in Northern Ireland since the middle of the 19th Century. The region has a strong history as a world leader in the areas of ship building, linen and associated textile industries. Despite recent contractions in employment, the sector is still of importance employing nearly 90,000 people, or 12.7% of total employment. In addition, the sector accounts for 19.4% of Northern Ireland's total Gross Value Added (based on 2001 data). Furthermore, Northern Ireland's manufacturing sector exported £4,046 million of goods in 2002.

Recent trends in manufacturing in Northern Ireland

1.2 Over the last 30 years manufacturing employment has fallen from over 180,000 jobs to less than 90,000 compared to the positive growth in services. However, the analysis also shows that while employment has been in decline in the region, manufacturing output has performed considerably better. From 1996 to 2001 manufacturing output consistently grew at an average annual rate of over 7% compared with less than 1% p.a. in the UK as a whole. Since Q2 2001 the level of output has remained relatively stable.

Chart 1.1: Employment in manufacturing, NI and UK (1971-2003) and manufacturing output index, NI and UK (1996 -2003)



Note: Manufacturing employment includes self employed
Source: DETI, NS, Regional Forecasts

Source: DETI, NS

1.3 However, the changes in the sector have actually been much more complex than is suggested by this relatively simplistic picture of stable output and falling employment. Some of the key features of this change are as follows:

- Over the period 1998 to 2003, the number of manufacturing firms has also grown, albeit at a modest rate, and there is a smaller proportion of large firms. The new manufacturing sector consists of many small firms operating in a highly competitive environment;

- Outside the declining textile and clothing sector, Northern Ireland's manufacturing record is actually very good, with job creation in a number of sectors, especially over the post cease-fire period since 1995;
- Analysis of employment and redundancy data suggests that at least 2,000 manufacturing jobs have been created on average, each year since 1998 despite the well documented difficulties;
- Manufacturing employment has continued to provide a valuable source of additional jobs in areas of formerly high unemployment within Northern Ireland, although this leaves certain areas within Northern Ireland more vulnerable to the loss of manufacturing employment in the future;
- There is data to suggest that this faster growth in sectors outside textiles and clothing has been reflected in a catch-up in labour productivity with Great Britain; and

Table 1.1: Manufacturing employee, GVA and productivity change for selected sectors, NI: 1993-2003

	Change in Employment (%)	Change in GVA (%)	Change in Productivity (%)
Food	-7.8	42.3	54.4
Textiles	-59.0	-52.3	16.5
Wood	24.0	-15.9	-32.2
Pulp & paper	4.4	10.3	5.6
Chemicals	-6.3	85.5	97.9
Rubber & plastics	25.3	46.4	16.8
Other non-metals	52.0	47.8	-2.7
Metals	31.8	61.7	22.7
Machinery & equipment	0.9	7.5	6.5
Electrical & optical	46.5	168.1	82.9
Transport equipment	-2.8	17.7	21.2
NEC	63.6	26.4	-22.7

Source: DETI, NS, Regional Forecasts

- At the same time there remains a large number of small and medium sized firms many of which are owner managed or family owned, some of which have embraced change but others which have continued with limited ambitions.

1.4 Other findings from the analysis of recent trends can be summarised as follows:

- Analysis at 3 digit and 4 digit SIC sectors suggested that growth took place across a range of sectors;
- Analysis of manufacturing wages showed that over the period 2000 to 2003, the average gross weekly earnings of labour fulfilling basic manufacturing

processes, compared to those in skilled trade activities, have increased at a faster rate; and

- Investment in manufacturing has fallen significantly as global conditions have worsened, but Northern Ireland's relative attractiveness is also under threat as a result of the potential loss of Selective Financial Assistance after 2006.

Global trends in manufacturing

1.5 The evidence suggests that in the more advanced economies, the service sectors has been growing more rapidly than industry and agriculture in the last two decades, while in the rest of the world, the most dynamic sector has been manufacturing. The key drivers changing the nature of competition have been identified as:

- Revolutionary changes in ICT;
- The increasing pace of change in science and technology;
- Increasing global competition;
- Changing consumer demand;
- Socio-demographic factors; *and*
- Environment / sustainability issues.

1.6 Many of the advanced western economies are facing the same problem of managing the change from the declining traditional manufacturing industries to a new technology based, knowledge intensive manufacturing sector. The requirements for this new view of manufacturing industry can be summed up by the seven pillars of the UK manufacturing strategy:

- **Macroeconomic stability:** allowing businesses to plan for the long term;
- **Investment:** working with modern, efficient processes and equipment;
- **Science and innovation:** helping manufacturers exploit the UK's strong science base to create innovative, high-value products;
- **World class best practice:** raising productivity and competitiveness by continuous improvement;
- **Skills and education:** developing a skilled and innovative manufacturing workforce;
- **Modern infrastructure:** providing effective transport and communications network; and

- **The right market framework:** providing the business environment manufacturing needs to compete globally.

Views of the sector

1.7 The findings from the survey of 162 local manufacturing firms and the consultations (with over 10 sectoral organisations, Government Departments, and Government Agencies) complemented the findings from the literature review and the analysis of recent trends. The key issues arising from the views of local business (the survey) on the manufacturing sector can be summarised as follows:

- Competitive cost pressures are high in the sector and are expected to continue with 84% of businesses reporting that costs had increased faster than inflation;
- A growing proportion (25% of respondents) of local manufacturing businesses are considering relocating or expanding their business outside Northern Ireland, particularly in relation to basic manufacturing processes; and
- The interview programme highlighted the acceleration in globalisation, advances in technology, pressure on the supply chain and the burden of environmental legislation as key issues for manufacturing businesses going forward.

1.8 These pressures have been exacerbated by increased competition from new European member states and the Far Eastern economies. Globalisation is taking place at an accelerated pace and this has direct implications for future manufacturing employment in Northern Ireland.

1.9 In relation to suggestions of how the individual firm, sector and Government should respond to these global challenges, the views of sectoral organisations, Government Departments and Agencies can be summarised under the following headings:

- **Productivity:** It was suggested that the individual firm needs to work more closely with educational institutions with the latest commercial developments, while providing feedback on skill requirements. In addition, it was felt that Government should encourage co-operation between Universities, FE colleges and industry in terms of both research and training. Furthermore, it was also suggested that Government should encourage Universities to improve their commercial awareness.
- **Innovation:** It was suggested that firms need to invest more in R&D, spend more time listening to their customers and focus on niche markets. In addition, it was also suggested that a co-ordinated approach to R&D by the sector would also be helpful.
- **Capabilities:** It was suggested that the managers of individual firms must be skilled in technology as survival cannot be based on doing more of the same.

- **Entrepreneurship:** It was felt that the sector needed a more co-ordinated approach in almost all areas of business. Regardless of the mixed response to how effective clusters had been, there was hope that they would be successful in the future. It was also highlighted that the old system of preferential assistance (e.g. Standard Capital Grants) had eroded competitiveness as Government had been trying to sustain businesses which were unsustainable, when they should be helping to transform them.
- **Outward focus:** It was felt that the individual firm should be looking further a field to export their products. It was reported that the Trade Missions run by Invest NI were successful and should continue.

Forecasts for the manufacturing sector

1.10 The forecasts suggest a number of important conclusions:

- The manufacturing sector as a whole is likely to contract in employment terms, both in Northern Ireland and elsewhere;

Table 1.2: Sub-sectoral employment and output forecasts, NI and UK: 2004-2014

	Per annum change in employment (%)		Per annum growth in GVA (%)	
	NI	UK	NI	UK
Food	-1.0	-1.9	2.1	1.1
Textiles	-6.6	-10.0	-1.4	-2.3
Wood	-0.9	-1.7	0.7	-0.2
Pulp & paper	-1.7	-2.4	1.9	1.0
Coke & oil	-3.3	-2.7	1.9	1.0
Chemicals	-2.5	-3.2	3.9	3.0
Rubber & plastics	-1.3	-1.7	2.8	1.9
Other non-metallic minerals	-3.9	-3.8	2.2	1.2
Metals	-4.0	-4.5	1.8	0.9
Machinery & equipment	-3.0	-3.4	2.0	1.0
Electrical & optical	-1.7	-3.3	4.4	3.4
Transport equipment	-1.5	-3.6	3.2	2.3
Other	-0.4	-1.1	1.6	0.7
Total manufacturing	-2.1	-3.1	2.4	1.6

Source: Regional Forecasts

Note: Employees in employment

- The scale of this decline is likely to be in the order of just over 18,500 jobs (including self employed) lost to a total of 72,500 by 2014;
- Productivity improvements will mean that overall GVA will continue to rise by an average of 2.4% per annum in the period to 2014;
- Not all sectors will be impacted equally with the most cost sensitive export sectors, such as textiles, metals and transport equipment most acutely impacted;

- Under a revived investment scenario, increased levels of new inward investment job promotion result in a more modest decline in manufacturing employment, driven by more positive prospects for the chemicals and electrical and optical sectors;
- The lower scenario, based on declining investment within Northern Ireland firms and no significant new inward investment, reduces the manufacturing sector to 51,400 employees with electrical and optical, transport and traditional sectors suffering heavy losses;
- At the same time, it is still possible to generate growth in a number of specialist niches despite the overall trend of employment decline; *and*
- Locally the impact of contraction will be relatively diverse with the data suggesting Mid-Ulster is most at risk.

1.11 The projections suggest that the promotion of competitiveness, the management of decline at an aggregate level and support of niche and specialist 'new' industries are the tasks facing policy makers in Northern Ireland, and other regional authorities in UK. The outlook for investment remains crucial for the overall manufacturing prospects. The potential impact of the changes in funding available post 2006 is also of importance when reviving the sectors prospects. The importance of manufacturing to output, exports and local prosperity should not be underplayed, nor the potential impact of continued employment contraction ignored. Suggesting the need for the development of an agenda on the way forward for the sector.

Policy observations and recommendations

1.12 This research has been focused on the **future** role of manufacturing. However, it is important to recognise the important historic role that manufacturing has played in the development of the local economy, beginning with the ship building and linen industries and continuing with a number of other sectors and important firms. Nevertheless, it is equally important to recognise, as the research demonstrates, that this role is changing and will change further. Some of the key features of this new role can be summarised as follows:

- The importance of innovation and design;
- The outsourcing of parts of the manufacturing process;
- The development of products with niche markets and high added value;
- The importance of knowledge-based products and processes;
- The reduced role of inward investment, or FDI, in creating new manufacturing employment;
- The increasing importance of sustainable products and processes; *and*

- Increased output but with less employment.
- 1.13 For those who believe that manufacturing is the source of all wealth creation and for those who have not embraced the new role of manufacturing, this can be a difficult message to accept. Businesses and workers engaged in more traditional manufacturing activity serving local markets feel that their economic contribution is under valued. The recent surge in the costs of doing business in Northern Ireland, and the proposals to remove industrial de-rating for manufacturing firms, tend to heighten these fears and anxieties.
- 1.14 Nevertheless, it is important to recognise that the manufacturing industry throughout developed economies is going through a period of rapid change. It is important that this change is managed as efficiently and effectively as possible. The message also needs to be articulated to, and understood by, all the key stakeholders.
- 1.15 It is important to stress that this does **not** mean that any business that is making low tech products for local markets, and not producing knowledge-intensive products for an international market, faces closure. There must always be, and will always be a role for such businesses. However the core of our manufacturing activity needs to move towards the new role outlined above based on improved competitiveness. Indeed, the successful firms of the future will be characterised by the way they go about their business rather than the sector or market in which they are operating.
- 1.16 The research has identified a number of key sectors or markets with the potential for future growth:
- Bio-technology products including pharmaceuticals;
 - Environmentally sustainable products including recycling activities and those linked to renewable energy; *and*
 - Health related products, including food products with a positive health content.
- 1.17 However the research also found that, looking forward, the sub-sector in which a business is located is less important than the actual business itself. There are always opportunities (regardless of size) for businesses within manufacturing sub-sectors, however it is how the business reacts / operates which will determine success and failure. It was found that the characteristics of the successful manufacturing business include the following:
- A focus on both ends of the value chain – innovation and R&D at one end and sales and marketing at the other end;
 - A willingness to explore ways of outsourcing the manufacturing process stages of the business;

- A commitment to invest in research and development into new products and processes; *and*
- An ability to make full use of communications and networking with other businesses.

1.18 Building on the points above, Figure 1.1 was developed to illustrate the direction in which local manufacturing businesses need to move if they are to become or remain successful in the new competitive environment.

Figure 1.1: Profile of the successful future enterprise



1.19 Each of the four spectrums in the Figure above represents a key element of future success. Successful firms will shift their focus from low technology production processes to those based on innovation and incorporating R&D. They will be well connected and IT enabled, offering high value added products in niche markets. In addition, the workforce will be required to be well skilled and educated to operate in the new manufacturing environment and to support innovation in business.

1.20 Government policy therefore needs to be supportive of these trends in Northern Ireland. This support needs to be placed within the context of existing strategies:

- Economic Vision for Northern Ireland (DETI);
- UK Government's Manufacturing Strategy (DTI); *and*
- Invest NI Strategy.

1.21 In the light of these strategies and activities, we consider that there are three options for the way forward:

- **Status Quo** – there is already a great deal of activity going on in support of manufacturing industry in Northern Ireland. However, given the challenges facing the industry, as highlighted in this report, in our view a more focussed approach is required.
- **A new Manufacturing Strategy** – one way of addressing this is to develop a new strategy for Northern Ireland, based on the UK Strategy and the Economic Vision and encompassing the existing activity of Invest NI. This would help to highlight the importance and nature of the changes required and would help demonstrate commitment to support this change. However with government already committed to support on a sectoral and cluster basis, a new strategy may add an unnecessary level of bureaucracy.
- **Manufacturing Competitiveness Actions** – in our view there are a number of actions which might be taken to strengthen and supplement what is already being done under the banner of “*improving manufacturing competitiveness*”. This will also help to fill any gaps identified in the existing support infrastructure.

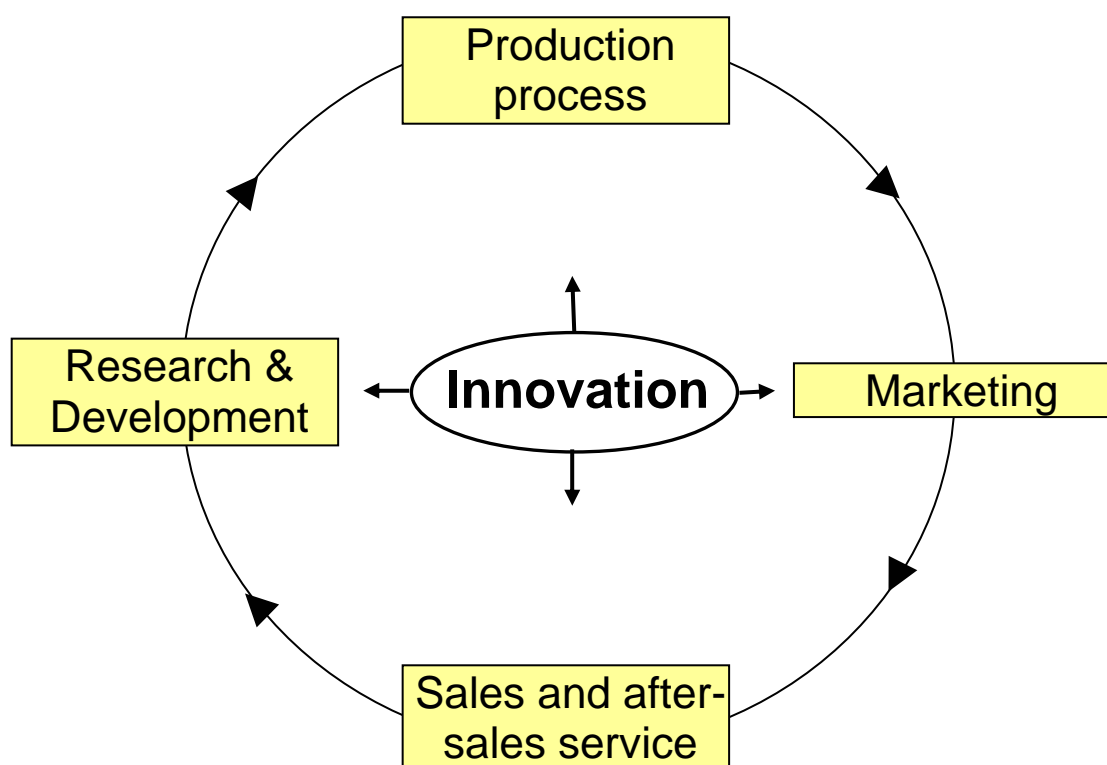
1.22 In the table below we have summarised the main advantages and disadvantages of these policy options.

Table 1.3: Assessment of Policy Options

Option	Advantages	Disadvantages
Status Quo/Do Nothing	<ul style="list-style-type: none"> • No additional public expenditure cost • Easy to implement 	<ul style="list-style-type: none"> • Does not address all the problems of adjustment • Unfocused on the sector’s needs
New Manufacturing Strategy	<ul style="list-style-type: none"> • Opportunity to co-ordinate and develop activity • Demonstrates government commitment • Moves the changing role of the sector up the political and economic agenda 	<ul style="list-style-type: none"> • Potentially expensive • Raises expectations • Requires high degree of public/private sector co-operation
Manufacturing Competitiveness Actions	<ul style="list-style-type: none"> • Based on Economic Vision • Limited additional public expenditure cost • Demonstrates commitment • Collaborative approach with private sector 	<ul style="list-style-type: none"> • May still result in declining employment • Communication will be challenging

- 1.23 On the basis of this assessment we consider that the third option, the ‘Manufacturing Competitiveness Actions’ is the appropriate way forward. In our view this group of actions needs to be carried out through close public / private sector collaboration and with a strong emphasis on communication of the way forward for small and medium sized manufacturing businesses. The main message for this communication is that there **is** a future for manufacturing industry in Northern Ireland, albeit different than before, and that it involves the encouragement of firms to move along the four spectrums set out in Figure 1.1 above.
- 1.24 Government may also wish to link these ‘Actions’ into its Regional Innovation Strategy for Northern Ireland by placing innovation at the heart of the manufacturing value chain as illustrated in Figure 1.2 below. This illustrates the need for innovation to impact on all stages of the value chain and not just the R&D and design phase. Firms need to be equally innovative in respect of production processes, marketing of products and sales and after-care service.

Figure 1.2: Improving manufacturing competitiveness: virtuous cycle of manufacturing value chain



Action recommendations

- 1.25 Based on the above strategic policy option of Manufacturing Competitiveness Actions, we have set out a number of suggestions. This is not designed to be a new strategy but rather to build on what is already being done and to work in collaboration with representatives of the manufacturing sector and other Government Departments such as DEL in doing so.

- 1.26 We have therefore set out our recommendations under the seven pillars of the UK Manufacturing Strategy, which is already in place and provides a framework for these actions. This provides a direct link with the overarching UK strategy and facilitates comparison with the activities of other regions under each of these pillars. Some of the proposed actions straddle more than one pillar so we have placed these under the main pillar to which it refers.

Pillar 1 – Macroeconomic Stability

- 1.27 This pillar allows businesses to plan for the long term and is outside the direct control of Northern Ireland government. However, it is important to recognise that a number of these macroeconomic issues impact directly on the prospects for local manufacturing industry. These include the following:

- Interest rate decisions by the Bank of England Monetary Policy Committee;
- Budgetary decisions on public expenditure and tax rates affecting industry;
- Future decisions on regional development expenditure and industrial support policy; and
- Exchange rate movements which, while outside direct Government control, impact directly on manufacturing exporters and the costs of business.

- 1.28 It is important also to recognise that a stable political environment is important to the development of business. In particular it affects the attractiveness of Northern Ireland to new inward investors. While this is also outside the control of the Department, it is important to place any policy recommendation in this context and to acknowledge the effect that it may have on outcomes.

- 1.29 We have not made any specific recommendations under this pillar but we have picked up these issues under overarching recommendations in respect of how they are debated and considered.

Pillar 2 – Investment

- 1.30 While the ending of our current status as an Objective 1 in Transition Region after 2006 will place a limit on what can be done directly to support firms through selective financial assistance, it will still be important for government and industry to work together to encourage appropriate and relevant investment in new technology. Traditionally Invest NI, like other regional development agencies, has adopted a sectoral approach, pursuing and encouraging investment in identified key growth sectors.

- 1.31 One of the key messages from this research is that the future role of manufacturing in Northern Ireland should focus on establishing dynamic firms within each sector that are adapted to the new role as described earlier and have the potential to succeed, whatever sector they are in.
- 1.32 This requires a twin-track approach by industry and Government:
- Encouraging and attracting dynamic firms in new high value added sectors of manufacturing; and
 - Working with existing small and medium sized firms in more traditional sectors of manufacturing to help them adapt to changing circumstances and to become more competitive.
- 1.33 Invest NI in collaboration with sectoral representative bodies has already developed strategies for both traditional sectors, such as clothing and textiles and more recently food processing, as well as some of the newer or developing sectors, such as biotechnology and aerospace. This research has not identified any particularly new or dynamic sectors outside those which are already being targeted. Rather it is the nature and number of individual dynamic firms within any of these sectors which will determine the future success of manufacturing in Northern Ireland.
- 1.34 We have made two recommendations in relation to promotion of investment in manufacturing to reflect the twin-track approach:

We recommend that Invest NI in collaboration with sectoral representative bodies should continue to pursue their various sectoral strategies and within these should focus specifically on encouraging investment in firms, products, processes and initiatives which enhance competitiveness in global markets.

We recommend that Invest NI should continue to meet with the relevant industry representative bodies to discuss cost-effective ways of facilitating the process of change in small traditional, family owned manufacturing businesses. This need to change in response to the new more competitive environment may involve mentoring, training and encouragement of acquisition.

- 1.35 We are also aware of the possible changes in selective financial assistance post 2006 and the challenges that this will present. This also places an imperative on local business as well as those responsible for encouraging economic development to take action.

We recommend that there should be a full economic impact assessment of the effects of the changes in selective financial assistance in NI in the light of:

- **The outcome of post 2006 negotiations on state aids;**
- **The need to encourage investment in high value added products and processes;**
- **The long lead times for the development of businesses in the new growth sectors; and**
- **The potentially high cost per job of new jobs created in manufacturing.**

1.36 Facilitating this change to a more competitive and dynamic manufacturing sector also requires individual firms to understand and adapt to the changing competitive environment.

We recommend that local manufacturing firms consult with their sectoral body or Invest NI and develop a clear business strategy for investing in products and processes which enhance competitiveness in global markets.

Pillar 3: Science & Innovation

1.37 Invest NI is already very active in supporting all businesses to exploit the existing scientific base in Northern Ireland to create innovative high value products and processes. 'Think-Create-Innovate', the Regional Innovation Strategy, coordinates the various programmes that are available in this area.

We recommend that within the existing Regional Innovation Strategy for Northern Ireland there should be a renewed focus on innovation at all stages of the business process, to highlight the requirement of moving from low value added activities to high value added innovative activities and products.

Pillar 4: Best Practice

1.38 This pillar relates to the need to raise productivity and competitiveness by continuous improvement. Organisations with assistance from Invest NI provides support for technology transfer in smaller companies and Invest NI's Technology Advisory Service helps small businesses focus on innovation and provide links with local universities and FE colleges. However, there may be other ways to assist firms to explore what these changes will mean for them, through other industry bodies.

We recommend that consideration should be given to establishing an initiative to allow local manufacturing businesses not only to explore best practice in technology and innovation in their sector as tends to happen at present, but also across other sectors, between suppliers and customers and between business and the science / innovation base.

- 1.39 Outsourcing of parts of the manufacturing process represents both an opportunity and a threat to Northern Ireland business. In our view the opportunity should be actively encouraged in relation to transferring out the lower added value elements of the process to more competitive locations, leaving the firm to concentrate on the higher value added and service-sensitive elements of the business in Northern Ireland.

We recommend that consideration should be given by the manufacturing sectoral bodies to raising the awareness of the opportunities that outsourcing provides to improve the competitiveness of local industry.

- 1.40 The development of networks, either physical or virtual, is an important element of any strategy for manufacturing industry going forward. Invest NI and the various sectoral representative bodies have made considerable progress in this area which is not easy given the relatively small scale of our manufacturing base. In our view this process needs to be encouraged and supported with the active participation of the sector bodies.

We recommend that manufacturing sectoral bodies should be encouraged to develop proposals for enhancing and strengthening “outward and forward looking” networking activities between firms both within and outside Northern Ireland, including the concept of combined manufacturing / service sector networks.

- 1.41 For Northern Ireland’s manufacturing sector to succeed in this new environment, they must be innovative in all parts of the manufacturing value chain, as illustrated in Figure 1.2 above. This may require a degree of re-education for local manufacturing firms and the embedding of an innovative approach to business development.

We recommend that all firms should seek to benchmark their business against best practice in all aspects of the business process.

Pillar 5: Skills and Education

- 1.42 This area of activity is about developing a skilled and innovative manufacturing workforce. Although it was not strictly within our terms of reference, its importance to the future development of manufacturing industry is such that it needs to form part of any forward strategy.

We recommend that DETI should provide on-going input to the outworking of the DEL Skills Strategy in relation to the implications of the changes in the role of manufacturing for the skills and education of the workforce. It should also highlight the need to strengthen skills in complementary service sectors such as sales, marketing, business, finance and management skills.

Pillar 6: Modern transport infrastructure

- 1.43 The envisaged changes in the role of manufacturing industry also have implications for the regional transport infrastructure. The Regional Strategic Transport Network Plan is currently under consultation as is the Investment Strategy for Northern Ireland. It is important that these plans reflect the future needs of the manufacturing industry which will require good ports and airports provision as well as roads transport infrastructure. Northern Ireland is suffering from an underinvestment in modern infrastructure which needs to be addressed.
- 1.44 The Investment Strategy for Northern Ireland has the objective of addressing the infrastructure gap. Over £2bn is earmarked for transport related investment over the 10 year period of 2005 to 2015. The Regional Transport Strategy for Northern Ireland is already giving rise to considerable investment. However, in the later years of ISNI, additional investment will be made in roads and this will result in higher standards of carriageways providing improved access for private and commercial traffic to all major cities.

We recommend that the needs of manufacturing industry should be clearly reflected in the latest transport investment plans and that DETI should take an active role in collaboration with the Strategic Investment Board in promoting investment in airports and ports and in roads provision.

Pillar 7: The Right Market Framework

- 1.45 Much of the regulatory environment for manufacturing industry is determined by legislation emanating from Brussels and London and this limits what can be done at local level. However, local business organisations should continue to press government for changes that will improve the competitiveness of manufacturing industry here.

Overarching recommendations

- 1.46 Finally, in our view there is a need to increase the awareness and understanding of issues relevant to the future of manufacturing in Northern Ireland, particularly among the small and medium sized enterprises that account for a large proportion of existing employment in the sector. A joined up approach is required between Government and Industry and also involving the UK Manufacturing Forum which has been set up to support the implementation of the Manufacturing Strategy throughout the UK.

- 1.47 In our view there is a need for a common understanding of the future role of manufacturing in Northern Ireland, which presents the positive view of the role of the sector instead of the current very negative view of a sector in decline and with no future. This more positive attitude then needs to be shared widely throughout the business and education sectors. This might take the form of a communications campaign which would require some further consideration.

We recommend that Government should develop a programme of action for a communication plan, to promote the key message that manufacturing has a future, but it will be those companies that are willing to change and adapt to the new realities that will survive. As an initial step, the Joint Industry Chair of the UK Manufacturing Forum should be invited to visit Northern Ireland to make presentations to the key representative bodies on the future role of manufacturing in the UK.

- 1.48 We also consider that there is a need for an on-going discussion with representatives of manufacturing industry on these matters. There are already a number of existing fora in which the sector engages with government.

We recommend that DETI and Invest NI meet with interest groups to discuss the findings of this report and ways to progress the recommendations. This should lead to the development of short focused action plan which might be based on the recommendations arising from this report.

- 1.49 Table 1.4 below takes each of the recommendations above and prioritises them based on their importance into high, medium and low categories:
- ‘High’ means that the recommendation is of top priority;
 - ‘Low’ means that the recommendation is still important but of relatively low priority because it represents a continuation of existing activity; and
 - ‘Medium’ means that the recommendations is important but is of less immediate priority than high priority.
- 1.50 In addition, Table 1.4 shows how each of the recommendations reflect the four underlying drivers of DETI’s Economic Vision, and whether the onus for achieving each recommendation is on the public sector, private sector or both.
- 1.51 It is clear from the table that the majority of recommendations are either of high or medium priority. Overall however, implementing these recommendations will help achieve the four economic drivers of the Economic Vision.

Table 1.4 Prioritising the recommendations and reflecting their linkages with the Economic Vision

Recommendation	Relative importance	Drivers of the Economic Vision	Public / private onus
Pillar 2 - Investment			
We recommend that Invest NI in collaboration with sectoral representative bodies should continue to pursue their various sectoral strategies and within these should focus specifically on encouraging investment in firms, products, processes and initiatives which enhance competitiveness in global markets.	Low	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Public
We recommend that Invest NI should continue to meet with the relevant industry representative bodies to discuss cost-effective ways of facilitating the process of change in small traditional, family owned manufacturing businesses. This need to change in response to the new more competitive environment may involve mentoring, training and encouragement of acquisition.	Low	Ensure our people have the right skills for future employment opportunities	Public and private
<p>We recommend that there should be a full economic impact assessment of the effects of the changes in selective financial assistance in NI in the light of:</p> <ul style="list-style-type: none"> • The outcome of post 2006 negotiations on state aids; • The need to encourage investment in high value added products and processes; • The long lead times for the development of businesses in the new growth sectors; and • The potentially high cost per job of new jobs created in 	High	Promote and encourage enterprise	Public

manufacturing.			
We recommend that local manufacturing firms consult with their sectoral body or Invest NI and develop a clear business strategy for investing in products and processes which enhance competitiveness in global markets.	High	Promote and encourage enterprise	Private
Pillar 3 – Science & innovation			
We recommend that within the existing Regional Innovation Strategy for Northern Ireland there should be a renewed focus on innovation at all stages of the business process, to highlight the requirement of moving from low value added activities to high value added innovative activities and products.	High	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Public
Pillar 4 – Best practice			
We recommend that consideration should be given to establishing an initiative to allow local manufacturing businesses not only to explore best practice in technology and innovation in their sector as tends to happen at present, but also across other sectors, between suppliers and customers and between business and the science / innovation base.	High	Increase investment in R&D and promote innovation / creativity Ensure our people have the right skills for future employment opportunities Promote and encourage enterprise	Public and private
We recommend that consideration should be given by the manufacturing sectoral bodies to raising the awareness of the opportunities that outsourcing provides to improve the competitiveness of local industry.	Medium	Increase investment in R&D and promote innovation / creativity Ensure our people have the right skills for future	Private

		employment opportunities Promote and encourage enterprise	
We recommend that manufacturing sectoral bodies should be encouraged to develop proposals for enhancing and strengthening “outward and forward looking” networking activities between firms both within and outside Northern Ireland, including the concept of combined manufacturing / service sector networks.	Medium	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Private
We recommend that all firms should seek to benchmark their business against best practice in all aspects of the business process.	Medium	Promote and encourage enterprise	Private
Pillar 5 – Skills & education			
We recommend that DETI should provide on-going input to the outworking of the DEL Skills Strategy in relation to the implications of the changes in the role of manufacturing for the skills and education of the workforce. It should also highlight the need to strengthen skills in complementary service sectors such as sales, marketing, business, finance and management skills.	Low	Ensure our people have the right skills for future employment opportunities	Public and private
Pillar 6 – Modern transport infrastructure			
We recommend that the needs of manufacturing industry should be clearly reflected in the latest transport investment plans and that DETI should take an active role in collaboration with the Strategic Investment Board in promoting investment in airports and ports and in roads provision.	Medium	Ensure a modern infrastructure in place to support business & consumers	Public

Overarching			
<p>We recommend that Government should develop a programme of action for a communication plan, to promote the key message that manufacturing has a future, but it will be those companies that are willing to change and adapt to the new realities that will survive. As an initial step, the Joint Industry Chair of the UK Manufacturing Forum should be invited to visit Northern Ireland to make presentations to the key representative bodies on the future role of manufacturing in the UK.</p>	<p>High</p>	<p>Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise</p>	<p>Public</p>
<p>We recommend that DETI and Invest NI meet with interest groups to discuss the findings of this report and ways to progress the recommendations. This should lead to the development of short focused action plan which might be based on the recommendations arising from this report.</p>	<p>High</p>	<p>Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise Ensure our people have the right skills for future employment opportunities Ensure a modern infrastructure in place to support business & consumers</p>	<p>Public and private</p>

II Background

Introduction

- 2.1 The Department of Enterprise, Trade and Investment (DETI) currently views the future role of manufacturing in Northern Ireland as a priority research area. The overarching aim of this research is: *“To assess the potential role of the manufacturing sector in Northern Ireland over the next ten years and identify / forecast where opportunities and threats exist for the future expansion / development of the sector / specific sub-sectors”*.

Terms of reference

- 2.2 The invitation to tender identified a number of research objectives that should be addressed:

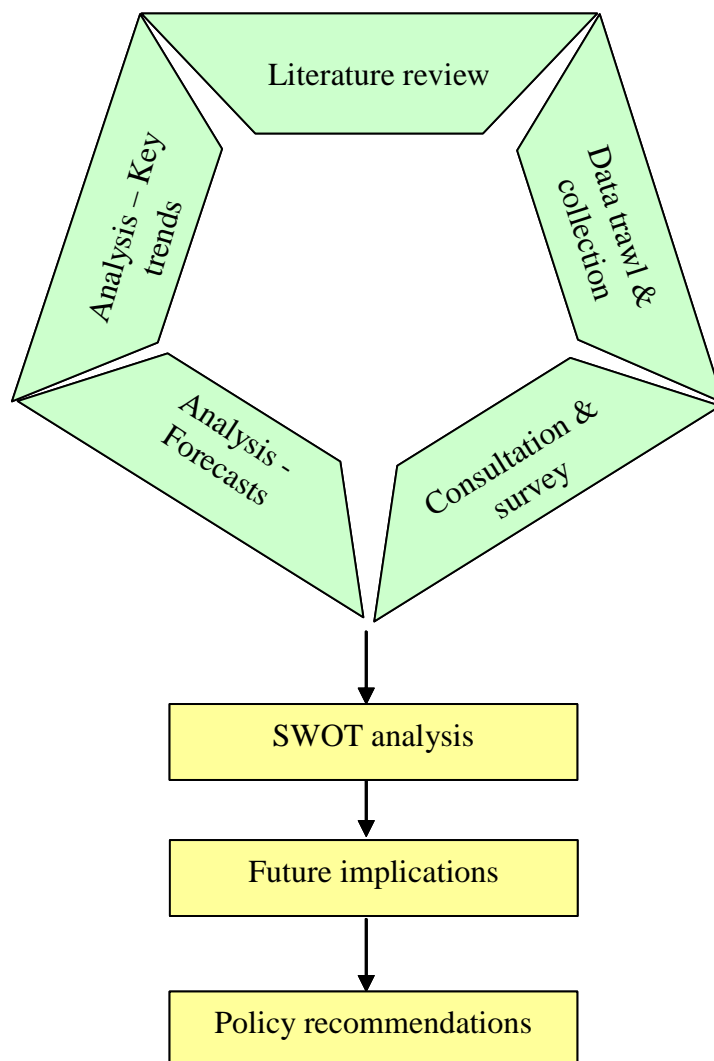
- To survey current manufacturing sector development in Northern Ireland compared to the UK and other EU regions (in particular, ROI) and the US, involving an examination of:
 - Contribution to the economy in terms of employment, research and development / innovation activity, exports, output and gross value added; *and*
 - Productivity levels.
- The survey should be detailed at a suitable sub-sector level (subject to data availability) and include a survey of foreign versus indigenous ownership.
- To identify the key global trends in manufacturing, and to review the demand-side and supply-side drivers of those trends;
- To identify the corresponding demand-side and supply-side constraints in the Northern Ireland manufacturing sector;
- To project forward future trends for manufacturing sector development in Northern Ireland, based on the existing structure of Northern Ireland manufacturing and policy framework. To assess the sector’s future contribution to Northern Ireland economic development under this scenario in ten years time including a forecast at 2014 (detailed at suitable sub-sector level – subject to data availability) of employment, output, gross value added (GVA) and exports, and how this compares to UK trends (and other comparator developed economy trends in the EU and US); *and*

- To assess the future implications for the Northern Ireland economy as a whole in terms of job quality and income levels under the projected scenario.

Methodology

2.3 In assessing the future role of manufacturing within the Northern Ireland economy, a structured methodological approach was designed for this assignment, tailored to address the key issues identified in the Terms of Reference. An overview of this approach is provided in the Figure below.

Figure 2.1: Overview of approach



Literature review

- 2.4 An extensive literature review was undertaken on the development of the manufacturing sector and its key sub-sectors, including trends in the UK, EU and USA. This is reported in Annex D.

Data trawl and collection

- 2.5 Using a range of sources, an extensive amount of statistical information was collected to develop an accurate picture of the Northern Ireland manufacturing sector. Particular focus was placed on the data with respect to the manufacturing businesses and sub-sectoral information. Where possible, data was collected to cover the UK, US and major EU countries (in particular RoI).
- 2.6 The output from this data trawl was a bespoke database containing the necessary data to provide an empirical basis for understanding the current economic conditions in the manufacturing sector and hence a basis for generating forecasts.
- 2.7 The types of data collected included, for example:
- Employment data;
 - Research and Development / innovation activity data;
 - National accounts data;
 - Earnings;
 - GDP / GVA / Output data; *and*
 - Productivity data.

Consultations and survey

- 2.8 In order to understand the potential role of the manufacturing sector in Northern Ireland, it is important to have an informed understanding of the manufacturing sector not only in Northern Ireland, but also in other major economies (e.g. UK, US and major EU economies). In this respect PwC utilised its contacts in regional offices in all of the relevant countries and our macro-economics team based in London. Senior economists were consulted within each of these countries to help deepen our understanding of their economies, their strategic direction and industry specific trends in the medium term.

- 2.9 In addition to the consultations at a country level, we conducted a survey of Northern Ireland manufacturing firms and undertook consultation interviews with Northern Ireland trade bodies and sector representatives in order to gauge the views of the private sector in Northern Ireland as to the potential opportunities and threats that may exist for the future development of the sector.
- 2.10 The survey of firms was aimed at approximately 150 businesses in Northern Ireland, and targeted at CEO level. The survey was carried out by telephone and covered a representative sample of businesses.

Analysis

- 2.11 The analysis took two broad forms, the analysis of key trends and the development of forecasts:
- Analysis of key trends involved analysing historical and current trends in employment, output, and productivity, in Northern Ireland UK, UK regions, EU economies, and the US; *and*
 - Development of forecasts for 2004-14 using the RF/OEF Regional model and the OEF macro-economic forecast for the UK and World economies produced in Autumn 2004. This included forecasts for sub-sectors of manufacturing and involved re-estimation of equations/revised forecasts for the existing 2 digit sub-sectors; and estimated projection of past trends for 2 digit sub-sectors in Northern Ireland and the UK as a whole. These forecasts were also compared with those produced for the UK.
- 2.12 It is worth noting that the analysis presented in Section III shows that over the last decade employment has been falling in the manufacturing sector while output and productivity have been increasing. As a result it suggests that the traditional 'health check' of the manufacturing sector, based on employment data, is no longer appropriate. Instead the future of the sector is dependent more on changes in output and productivity. However given the relatively better availability and reliability of employment data compared to output and productivity measures, the analysis of historical trends in the manufacturing sector is skewed to reflect these current data restrictions.

SWOT analysis

- 2.13 The SWOT analysis provided a suitable framework to summarise the project by drawing together, at both Northern Ireland level and sectorally, the specific SWOT information. The analysis covered broad, and sector specific issues relating to the opportunities and threats that exist for the future expansion/development of the sector.

Future implications

2.14 Future implications for the Northern Ireland economy were then assessed in terms of job quality and income levels. This included analysis of full and part-time working, male and female employment and where possible skills levels in each sector. Analysis of wage levels were based on data from the New Earnings Survey.

Policy recommendations

2.15 Using the findings from the data analysis, SWOT analysis and future implications sections, we prepared a policy recommendations section on the future role of the manufacturing sector in Northern Ireland.

Report Structure

2.16 The report is structured as follows:

- **Section III – Recent trends:** this section analyses the recent trends in the manufacturing sector and associated sub-sectors in Northern Ireland, and provides a comparison to the UK, US and EU trends;
- **Section IV – Literature review:** this section provides a review of the current body of relevant literature on the main global trends in manufacturing;
- **Section V – Views of the sector and Government:** this section summarises the views Sectoral organisations, Government Departments, Government Agencies and 164 local manufacturing businesses on the manufacturing sector;
- **Section VI – Forecasts:** this section presents the results from the economic forecasts and provides an analysis of their significance;
- **Section VII – Policy observations and recommendations:** this section highlights the strengths and weaknesses of the manufacturing sector in Northern Ireland and the associated potential opportunities and threats. It also provides an assessment of the future implications for the manufacturing sector in Northern Ireland and offers a range of policy recommendations based on the evidence gathered.

III Recent trends in manufacturing in Northern Ireland

Introduction

3.1 This Section provides an overview of the analysis presented in Annexes B and C. It discusses the recent trends in the manufacturing sector and associated sub-sectors in Northern Ireland. In addition it supplies a comparison with the UK, US and EU trends. The objective of this Section is to provide an understanding of how the manufacturing sector is structured in Northern Ireland and how it has performed across a range of key economic variables, thus establishing a basis for the remainder of the report. This Section takes the following structure:

- Decline or growth?;
- Sector in context;
- Sectoral trends;
- Sub-sectoral trends;
- Wages;
- Manufacturing start-up rates;
- Ownership;
- Local trends;
- International comparisons;
- Financial support and investment; and
- Conclusions.

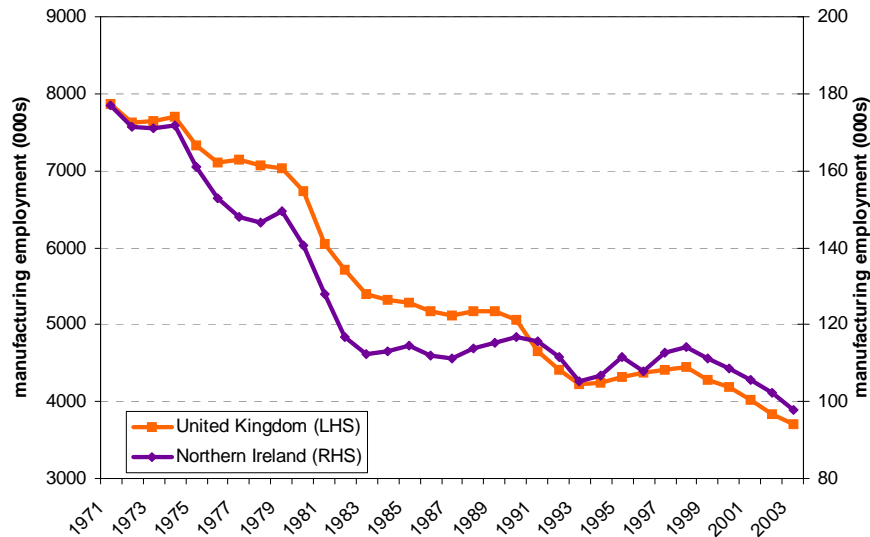
Decline or growth?

3.2 During the 19th Century, parts of Northern Ireland, in particular Belfast, underwent considerable industrialisation. The port of Belfast became one of the most important ship building areas in the world, and was key to the British Imperial economy and to both World War efforts. Belfast also became the centre for many linen mills and associated textile products such as rope. The importance of these two broad manufacturing sectors in the region's economy continued after World War II. However with the recent and much publicised decline in textiles and ship building in developed economies, the products through which the region became world leaders gradually contracted.

Employment data suggest recession

3.3 The long term trend in manufacturing employment in Northern Ireland, as in the rest of the UK, is downwards, as indicated in the chart below.

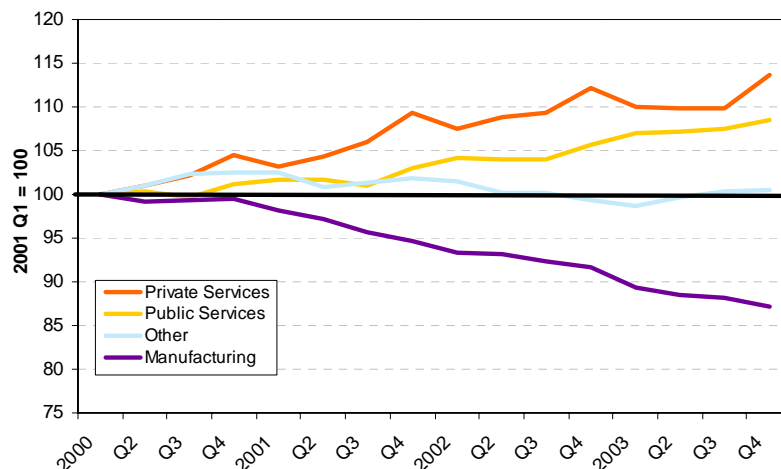
Chart 3.1: Employment in manufacturing, NI and UK: 1971-2003



Note: Manufacturing employment includes self employed
 Source: DETI, NS, Regional Forecasts

3.4 The chart depicts a strong recent contraction in Northern Ireland employment since 1998 after a period of stability during the 1980's and 1990's. By June 2004, manufacturing employment had reached an all time low of 88,920 in Northern Ireland. The short term series in the chart below sets out the recent Northern Ireland employment data in more detail.

Chart 3.2: Short term trends in employees in employment, NI: 2000Q1 – 2003Q4 (2000Q1 = 100)



Note: Excluding self employed

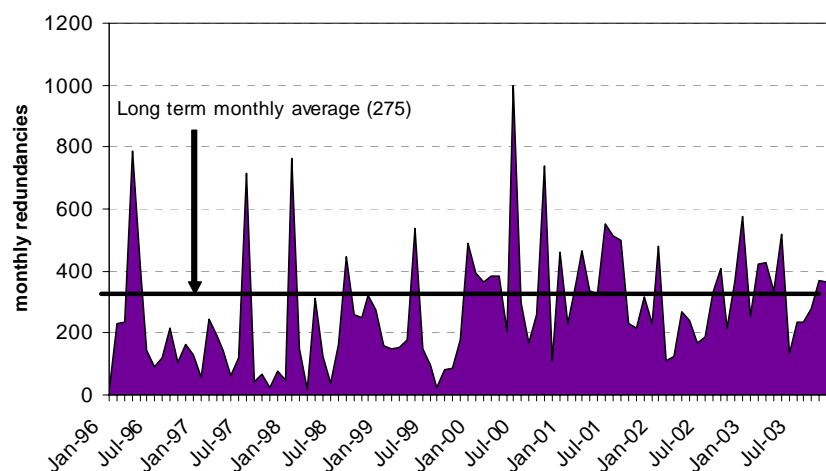
Source: DETI

- 3.5 The 12 consecutive quarters of job loss in manufacturing would suggest a firmly “recessionary” trend for the sector. This is in contrast to the path of both public and private services which have grown over the same period.

Gross employment gain and loss - picture less clear cut

- 3.6 The overall employment series presented above is net and therefore masks any job creation that may be occurring and offsetting job losses. The monthly redundancy trends in manufacturing are set out in the chart below.

Chart 3.3: Manufacturing redundancies, NI: 1996 - 2003

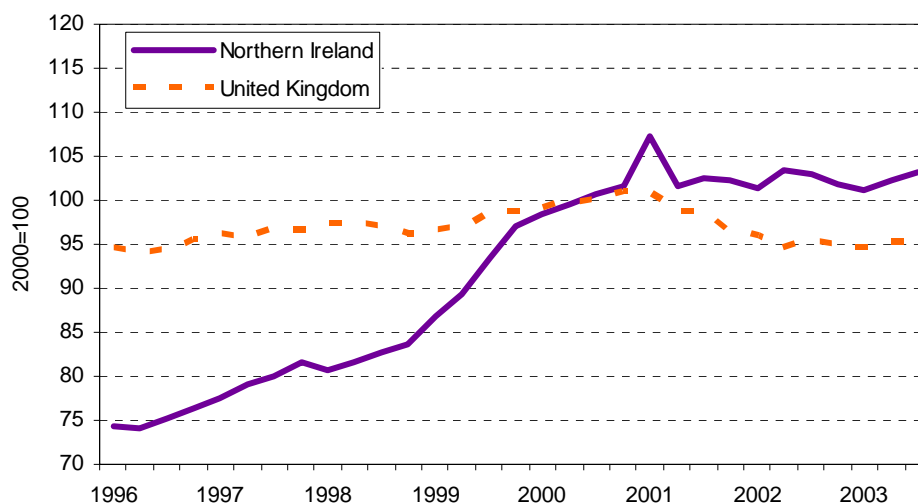


Source: DETI

- 3.7 The total manufacturing job loss over the period 1996-2003 as measured by redundancy statistics is recorded at 26,440 jobs. Given that, over the same period, recorded manufacturing employees in employment fell by 11,180, this suggests that at least 15,000 jobs were created since 1996 in manufacturing. This figure of almost 2,000 jobs per annum is a significant level of job creation, in contrast to the overall picture of decline.

No recession in output

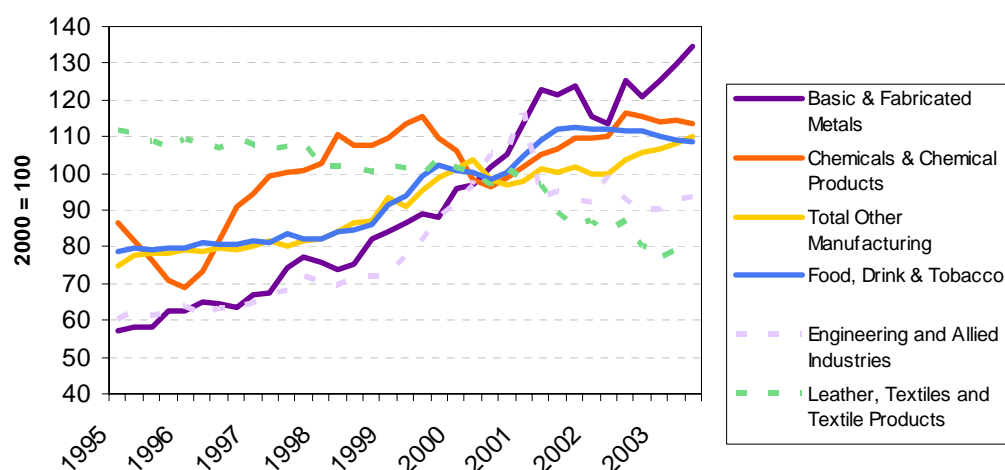
- 3.8 Despite the recessionary pattern in overall employment, the output data suggests rather different trends. The figure below sets out the manufacturing output index data since 1996 for Northern Ireland and UK.

Chart 3.4: Manufacturing output index, NI and UK: 1996-2003

Source: DETI, NS

- 3.9 Manufacturing output rose considerably in the period 1996-2000 in Northern Ireland despite the corresponding loss in jobs over that period (post 1997). Growth in the Northern Ireland index has, since late 2002, been more closely correlated with the UK output index, and overall output below the peak experienced in 2001.
- 3.10 It is likely that the divergence in employment and output levels is at least in part explained by the loss of jobs in the least profitable firms and improvements in output levels from existing firms as trading conditions have improved. This suggests many firms were operating below capacity during the recent global downturn and as exchange rates have improved for exporters and world demand (particularly from the US) has begun to grow firms have been able to respond with increased output.
- 3.11 The sectoral output index provides further detail on recent trends and is set out in the chart below.

Chart 3.5: Manufacturing sectoral output index, NI: 1995-2003



Source: DETI

3.12 The sectoral picture shows marked contraction in textiles and also a sharp retrenchment in engineering output post 2001 after the collapse of the high tech boom. Metals, chemicals and, to a lesser extent, food have contributed to the overall growth in the manufacturing output index in recent years with metals particularly strong over the last 18 months.

Some slow down in exports

3.13 Recorded manufacturing exports have fallen since peaking in 1999, largely as a result of the decline in electronics and the continued closure of textiles firms. Despite the 4.4% real terms fall since 1999, current export values are still 7% above the level in 1998. The nominal fall in exports since 2000 of 0.8% is in contrast to the overall increase in manufacturing output of approximately 2.4% over the same period.

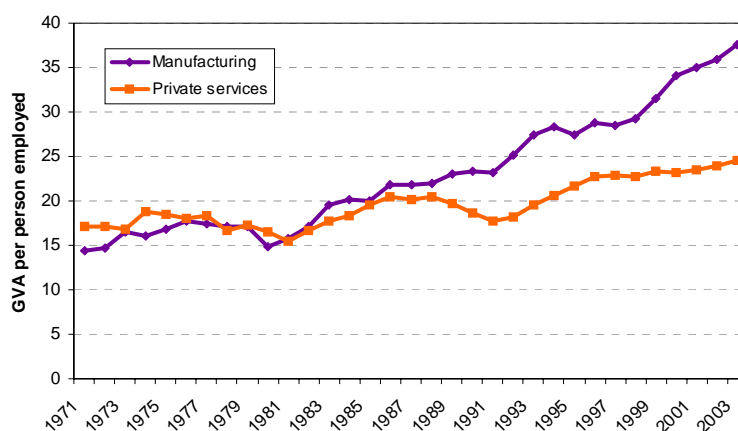
Table 3.1: Manufacturing exports, NI: 1992 to 2002

	Nominal Manufacturing Exports £m	Manufacturing Exports £m (2000 prices)
1992	1784	2194
1993	2175	2633
1994	2603	3076
1995	3013	3441
1996	2989	3334
1997	3127	3381
1998	3490	3649
1999	3974	4092
2000	4080	4080
2001	4076	4005
2002	4046	3911

Source: DETI, Regional Forecasts

Note: Real exports calculated using an RPI deflator

- 3.14 Another important contextual issue in relation to the manufacturing sector is the path of productivity over time. Manufacturing productivity rapidly outstrips productivity growth in the service sector, which is much more labour intensive, this is highlighted for Northern Ireland in the chart below.

Chart 3.6: Productivity in manufacturing and private services, NI: 1971-2003

Note: Manufacturing employment includes self employed

Source: DETI, NS, Regional Forecasts

- 3.15 The productivity pattern is confused somewhat by existing uncertainty over the true position of Northern Ireland Gross Value Added (GVA). The Annual Business Inquiry (ABI) data and Regional Accounts differ markedly in their measurement of Northern Ireland manufacturing GVA. According to the ABI, Northern Ireland GVA per employee in manufacturing was above the UK rate by 3% in 2000 but the Regional Accounts data suggests a deficit of 10%, this is discussed in more detail in the box below.

Box 3.1: Measuring output – the data debate

The two primary sources for manufacturing GVA data for Northern Ireland are Regional Accounts and the Annual Business Inquiry (ABI). The table below sets out the apparent divergence between the two sources.

Table A: Comparison of relative productivity

	Regional Accounts NI/UK	ABI NI/UK
1998	0.86	0.92
1999	0.88	0.99
2000	0.90	1.03
2001	-	0.99
2002	-	0.95

Source: Regional Accounts, ABI

Despite careful data consideration it has not been possible to reconcile these two data sources. Work is ongoing with DETI to attempt to resolve this crucial issue.

- 3.16 The ABI data, if it is to be believed, supports the strength of manufacturing output suggested by the output index, whilst Regional Accounts data provides less encouragement for the sector. The Regional Accounts data is the data used in the forecasts presented later in this report as it is available on a supposedly consistent basis for all regions and is consistent with UK national data presented in the Blue Book. In addition it covers all sectors of the economy, which the ABI does not, making it unsuitable for a whole economy model. The considerable lag in sectoral GVA data makes 2001 the most recent regional data available for modelling purposes.

Sector in context

- 3.17 The manufacturing sector remains a very important component of the Northern Ireland economy. Despite recent employment decline in Northern Ireland's most prominent manufacturing sub-sectors such as textiles, the manufacturing sector still accounts for 12.7% of total employment, equal to the UK average. Expressed as a percentage of working age population, Northern Ireland's manufacturing employment is below the UK average at 9.1% compared to 9.9%, largely a result of lower participation rates in Northern Ireland..
- 3.18 The analysis in Annex B reveals that Northern Ireland is not as manufacturing dependant as is often suggested. Indeed on a working age population basis it has the 4th lowest manufacturing employment concentration and if London was excluded it would be well below the UK average.

Sectoral trends

Employment

3.19 The discussion above has set out the overall picture for the manufacturing sector but this aggregate data masks some very divergent trends at a sub-sectoral level. The table below sets out both the concentration of employment in the manufacturing sub-sectors and the job change over the last decade in Northern Ireland.

Table 3.3: Manufacturing sub-sectoral concentrations and employee change, NI 1993 to 2003

	Employees in Employment 03 (000's)	Location Quotient	Change 93-03 (000's)
Food	18.7	1.4	-1.6
Textiles	10.0	1.8	-14.4
Wood	3.3	1.4	0.6
Pulp & paper	6.4	0.5	0.3
Coke & oil	0.1	0.1	0.0
Chemicals	3.4	0.5	-0.2
Rubber & plastics	7.0	1.1	1.4
Other non-metallic minerals	5.7	1.6	2.0
Metals	6.2	0.5	1.5
Machinery & equipment	6.5	0.7	0.1
Electrical & optical	10.2	0.9	3.2
Transport equipment	11.0	1.1	-0.3
Other	4.2	0.7	1.6
Total manufacturing	92.7	0.9	-5.9

Source: DETI, NS, Regional Forecasts

Note: The location quotients presented are calculated by dividing the Northern Ireland employee level by the working age population. This figure is divided by a similar ratio from the UK data. As such a figure of 1 represents a sector of an equivalent UK average size.

3.20 In employment terms only 4 of the 13 sub-sectors have lost jobs in the last decade, with textiles dominating the job loss total. Indeed without textiles job loss manufacturing would have expanded by 8,500 jobs over the last decade. In UK terms, Northern Ireland has an above average employment concentration in 6 of the 13 sub-sectors with textiles and non-metals the most striking. Further details are provided in Annex B which sets out employment, GDP and productivity charts for Northern Ireland and UK for each sub-sector.

- 3.21 The analysis in Annex B also shows that, when we consider the impact of redundancies on overall employment data, there has been some job creation across most sub-sectors in Northern Ireland since 1996. In all sectors (with the exception of textiles) the redundancy levels are greater than the overall change in employees, suggesting some job creation offsetting the redundancy data. Assuming all job losses are reported, the data would suggest over 15,000 jobs have been created since 1996, almost 2,000 per annum. Perhaps most notable is electrical and optical, where an increase of 660 jobs since 1996 masks 4,310 job losses, suggesting that almost 5,000 jobs have been created in this sector since 1996.

Output

- 3.22 The job losses reported have not been matched by corresponding output falls as productivity increases have allowed overall value added to rise in most sectors. The table below compares real value added change to employee change over the last decade, and sets out the change in productivity over the same period.

Table 3.5: Manufacturing employee, GVA and productivity change for selected sectors, NI: 1993-2003

	Change in Employment (%)	Change in GVA (%)	Change in Productivity (%)
Food	-7.8	42.3	54.4
Textiles	-59.0	-52.3	16.5
Wood	24.0	-15.9	-32.2
Pulp & paper	4.4	10.3	5.6
Coke & oil	0.0	560.0	560.0
Chemicals	-6.3	85.5	97.9
Rubber & plastics	25.3	46.4	16.8
Other non-metals	52.0	47.8	-2.7
Metals	31.8	61.7	22.7
Machinery & equipment	0.9	7.5	6.5
Electrical & optical	46.5	168.1	82.9
Transport equipment	-2.8	17.7	21.2
NEC	63.6	26.4	-22.7

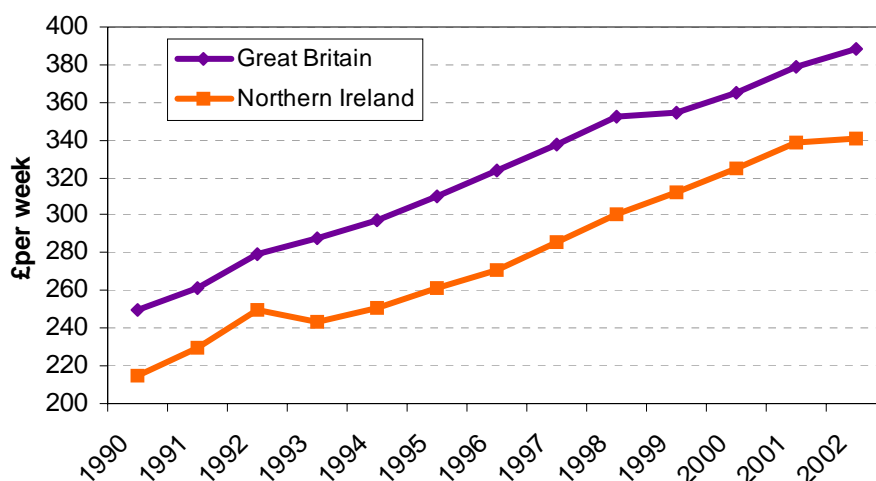
Source: DETI, NS, Regional Forecasts

- 3.23 The table reflects a diverse picture across the sub sectors. In general measured GVA has grown faster than employment, or contracted less sharply. Output and productivity gains have been most pronounced in the electrical and optical sector. In three sectors productivity is recorded as having fallen, in two cases by large amounts. These are unlikely to be trend declines in productivity and in our view result from large annual fluctuations in productivity or from mis-measurement in the GVA data.

- 3.24 The sectoral picture further supports our headline data which reveals a contrast between output and employment trends against a backdrop of overall decline in the relative importance of manufacturing within the wider regional economy. The analysis reveals the importance of textiles in job losses, with many other sectors showing significant improvements in productivity and creating significant numbers of new jobs. It is therefore important not to let the sharp contraction in textiles disguise the success in most other sectors.
- 3.25 Annexes B and C provide detailed analysis of the manufacturing sub-sectors. Annex B presents analysis at a 3 digit level, while Annex C presents the analysis at a 4 digit level (unfortunately due to data restrictions we were unable to produce comparable 4 digit level tables for GB, in addition, due to confidentiality reasons we are also unable to provide any statistics for the majority of 4 digit SIC sectors).
- 3.26 On the whole, caution needs to be taken when interpreting the drilling down exercises presented in Annexes B and C. It was found that regardless of the broad manufacturing sectors that firms' are working in, there are always success stories. So for example, in the declining textiles sector, there are 4 digit sub-sectors that are among the top performers in relation to employment growth. However, the analysis is restricted by confidentiality, the compatibility of the data with GB, and is reliant on the consistency of firms being categorised into the correct SIC sectors.
- 3.27 In addition, and as noted by Invest NI and a number of consultees, every economy in the world is chasing the next product, the next sector and the next niche. If statistical analysis were able to successfully identify future growth sectors, they would already be producing in them. Furthermore, it was also noted that these future growth markets would not necessarily be shown in the data, especially since it only covers up to 2002.
- 3.28 Annex C also provides some analysis on the extent to which manufacturing firms have been shifting to more service sensitive products and process. With the same restrictions and caveats on the data, we found little evidence to suggest that this trend had taken place. In order to fully address this issue more firm specific information or case studies would need to be available to form a definitive answer.

Wages

- 3.29 Moving away from employment and output data, we have examined wages data which shows average real wage increases despite the pressures in the sector. The chart below sets out wages since 1990 for male manual workers (the New Earnings Survey does not provide a consistent series for 'all workers' over time).

Chart 3.8: Trends in manufacturing wages, NI and GB: 1990-2002

Source: New Earnings Survey

- 3.30 The wage data suggest a relatively stable gap with UK wages of approximately 10-15%, and growth averaging around 4% per annum in Northern Ireland. After allowing for inflation, the rate of growth is below the rate of growth in productivity over the same period.
- 3.31 The Table below presents the change in average full-time gross weekly wages by selected SOC groups over the period 2000 to 2003.

Table 3.10: Growth in full time average gross weekly wages, by selected SOC 2000 major groups, 2000 to 2003

	Growth 2000-03 (%)
Process, plant and machine operatives	12.1
Process, plant and machine operatives	11.9
Transport and mobile machine drivers and operatives	12.1
Skilled trades occupations	6.6
Skilled agricultural trades	14.2
Skilled metal and electrical trades	3.6
Skilled construction and building trades	12.2
Textiles printing and other skilled trades	15.8
Total	12.2

Source: DETI

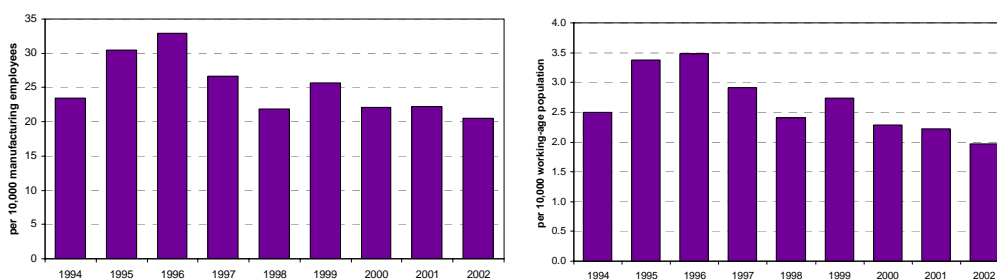
- 3.32 The Table shows that over the 3 year period, gross weekly wages or employment costs to local business have increased faster in relation to labour fulfilling basic manufacturing processes as apposed to labour in skilled trade activities. This recent trend has important implications for the local economy. If the employment costs of basic manufacturing processes are rising faster than skilled processes then it is fair to assume that Northern Ireland's historically low cost base is being eroded. Although a comprehensive analysis of international wages would be required, the evidence suggests that Northern Ireland's competitive advantage may be (or has) shifted to skilled manufacturing.
- 3.33 If this is the case then it may not be unreasonable for some Northern Ireland companies to find it cheaper to outsource basic production and specialise in the higher-skilled activities.
- 3.34 Analysis was also undertaken at 3 digit SIC sectors in relation to gross average weekly earnings. Due to confidentiality issues the statistical analysis is unable to be presented. However, the results of the analysis showed that, regardless of the broad manufacturing sector, there are activities that can generate high wages. In addition, regardless of the broad manufacturing sector there were 3 digit activities that were experiencing growth of average gross weekly wages of over 100% over the period 2000 to 2003, while in most cases there were also 3 digit sectors in the same broad manufacturing sector that experienced declines. Therefore this reinforced the emerging finding that although traditional manufacturing products and process may be in decline in the local economy, there are success stories and areas for high wealth creation in each 2 digit manufacturing sector.

Manufacturing start-up rates

- 3.35 Start-up data¹ for manufacturing in Northern Ireland suggest a decline in start-up rates from the level in the mid 1990's with 2002 start-up rates the lowest in the last 9 years. Start-up rates since 1994 are set out in the charts overleaf, expressed both relative to manufacturing employees and working age population.

¹ The data presented are for VAT registered businesses which does not include all manufacturing enterprises.

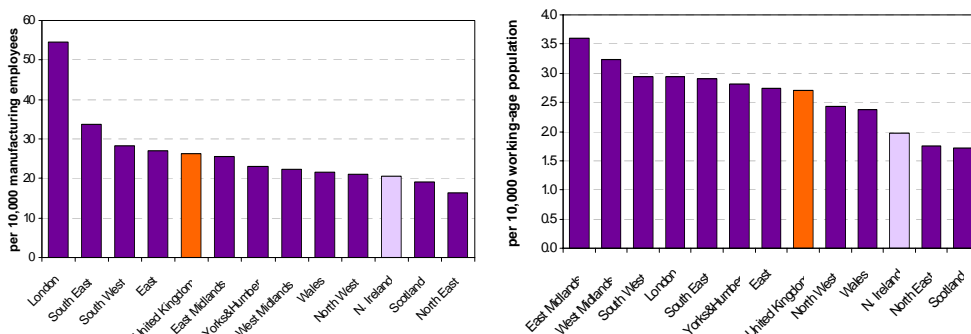
Figure 3.9: Manufacturing VAT registrations, NI: 1994-2002



Source: NS, Regional Forecasts

3.36 In a regional context Northern Ireland has below average start-up levels as depicted in the charts below.

Figure 3.10: Manufacturing VAT registrations, UK regions: 2002



Source: NS, Regional Forecasts

3.37 It is important to consider the impact of alternate denominators in the start-up analysis. The use of denominator has little interpretive impact with only North East and Scotland having lower start-up rates on either basis. Using manufacturing employment as the denominator increases the differential between start-up rates in the South East and London from elsewhere. The level of start-ups in manufacturing at a regional level is a close map to overall prosperity in the regions, with the least prosperous regions having the lowest start-up rates. The regions with the lowest concentrations of manufacturing employment, London South East, Scotland, Northern Ireland are clustered together in start-up levels.

3.38 Focusing on the stock of VAT registered businesses, the Table below presents the number of registered businesses in the manufacturing sector and growth over the period 1998 to 2003.

Table 3.11: Stock of VAT registered manufacturing businesses in NI, 1998 to 2003

	1998	1999	2000	2001	2002	2003
Number of Manufacturing Businesses	3790	3810	3800	3865	3850	3845
Annual growth	-	0.5%	-0.3%	1.7%	-0.4%	-0.1%
Total number of businesses	51759	51965	52955	53675	53515	53770
Manufacturing as a % of total	7.3%	7.3%	7.2%	7.2%	7.2%	7.2%

Source: DETI

3.39 Over the period the number of manufacturing firms in NI has remained fairly stable. As can be seen there has been a slight increase of 1.5% in the number of manufacturing firms in NI over the period, compared to an overall increase of 3.9% in the total number of businesses across all sectors in the economy. Therefore despite the decline in overall employment terms, the number of manufacturing firms has remained remarkably stable.

Ownership

3.40 Foreign ownership is higher in Northern Ireland in manufacturing firms than elsewhere in the economy as reflected in the Table below.

Table 3.12: Share of employees/businesses in foreign owned business, NI: 1999-2002

		1999	2000	2001	2002
% employment in foreign owned businesses	Manufacturing	32.4	40.7	38.0	40.3
% employment in foreign owned businesses	All Others	4.6	5.0	5.6	6.2
% foreign owned businesses	Manufacturing	3.5	4.0	4.0	4.3
% foreign owned businesses	All Others	0.5	0.6	0.9	0.9

Source: IBDR, NS, Regional Forecasts

Note: % employment in foreign owned businesses is calculated by expressing the number of employees in foreign owned businesses as recorded in the IDBR as a percentage of the number of employees in manufacturing

% foreign owned business is calculated by expressing the number of foreign owned businesses as recorded in the IDBR as a percentage of the number of VAT registered enterprises

3.41 The much higher proportion of employment in foreign owned businesses reflects recent Foreign Direct Investments in the region and the closure of many smaller locally owned firms. The level of employment in foreign owned manufacturing remains relatively stable at round two fifths of employment, but only 4% of businesses, a reflection of the larger size of foreign owned firms. In the climate of rising manufacturing employment levels in other lower cost countries, there is an increasing risk of relocation amongst firms which are not locally owned. This presents an increasing threat to the viability of manufacturing employment in the region.

Local trends

- 3.42 A full analysis of local trends can be found in Annex B. The analysis suggests that the North West and Mid Ulster including Craigavon, Magherafelt and Dungannon have the highest employment concentration, expressed in percentage terms, in the manufacturing sector. The Greater Belfast area has a smaller concentration of manufacturing as do farming dominated areas such as Omagh and Fermanagh. This pattern is similar to other regions where rising costs drive manufacturing out of the cities, which in turn become increasingly service sector dominated. Carrickfergus is the only exception to the overall pattern with a high concentration of manufacturing employment concentration despite its proximity to Belfast.
- 3.43 Examining share of businesses, as opposed to employment, moves Mid Ulster areas into the middle of the distribution as they have significant numbers of larger firms. Farming areas, with large numbers of small employers, move to the bottom end of the distribution.

International comparisons

- 3.44 Northern Ireland output growth over the last 10 years has been over 3 times the UK rate but still much lower than the US figure. Manufacturing is much less important in overall employment terms in Northern Ireland than it is in the UK and the US compared to other economies. These countries are typified by a loss in employment over the last decade which has been most pronounced in farming. Wages growth has been strong throughout the industrialised economies (and particularly the UK) in comparison to prices which have grown more moderately, as a result of productivity improvements and low cost competition. The contrast of manufacturing output growth in the US (44.1%) and Japan (3.5%) is remarkable and reflects the divergent economic fortunes in the two economies.

Table 3.14: Selected international comparisons

Country	Share total employees in manufacturing (03)	% change in manufacturing employees (93-03)	% change manufacturing output (93-03)	% change manufacturing producer prices (93-03)	% change manufacturing wages (93-03)
NI	13.9	-5.9	27.2	*	35.7
UK	13.1	-10.5	7.7	13.9	51.7
Germany	17.7	-16.5	22.8	9.1	30.3
France	16.2	-3.5	21.7	6.6	22.9
Italy	22.8	-0.6	13.4	24.8	32.0
Spain	*	*	36.5	*	*
US	14.1	-11.4	44.1	14.8	34.7
Japan	*	*	3.5	*	*

Source: OEF

Financial support and investment

3.45 Government financial support to industry is an important stimulus to growth in manufacturing. Part of the employment created through financial assistance is in the form of new foreign direct investment (FDI). Over the period since 1995, just under a quarter of all jobs promoted in Northern Ireland have been in the form of FDI. Most recently manufacturing firms have become a small minority of FDI into Northern Ireland (only 14% since 1995), and hence the great majority of manufacturing jobs promoted in Northern Ireland have been expansions and re-investments in companies already located here (although a significant proportion of these are foreign owned). The decline in global FDI since 2000, and a more general decline in local investment since the end of the high-technology boom, has meant a general decline in the total number of jobs promoted in Northern Ireland.

Table 3.15: Jobs promoted and safeguarded, NI: 95/96 – 01/02

	Jobs promoted			Jobs safeguarded		
	Total	Manufacturing		Total	Manufacturing	
	000's	000's	%	000's	000's	%
95/96	5678	4952	87.2	2484	2484	100.0
96/97	6005	5596	93.2	5577	5519	99.0
97/98	7137	4505	63.1	4254	4254	100.0
98/99	5434	3744	68.9	2931	2879	98.2
99/00	7145	3875	54.2	1796	1796	100.0
00/01	7596	3234	42.6	1896	1896	100.0
01/02	2896	1537	53.1	1711	1621	94.7

Source: InvestNI

3.46 The table highlights both the marked fall in jobs promoted and the fall in manufacturing share in this total. In jobs safeguarded, manufacturing remains the dominant sector, further reflecting the difficulties facing manufacturing firms. The percentage of new investment within the jobs promoted has also fallen to 26% from a high of just under 50% in 98/99. Not all jobs promoted actually materialise. InvestNI estimate that of promoted jobs 75-80% are actually created. Moreover some of the jobs promoted may have been created without government assistance (deadweight). A shift-share analysis of Northern Ireland manufacturing suggests that Northern Ireland creates around 1,500 jobs each year in excess of what would be expected on the basis of UK wide sectoral growth. This is well short of the 4,000 jobs promoted by InvestNI each year since 1995, and hence implies a level of deadweight especially among the expansions and re-investments of locally based firms.

Table 3.16: Jobs promoted by sector, NI; 95/96 – 01/02

	Jobs promoted				Jobs safeguarded			
	95/96-98/99		98/99-01/02		95/96-98/99		98/99-01/02	
	Average	% of manufacturing	Average	% of manufacturing	Average	% of manufacturing	Average	% of manufacturing
Food	519	11.0	388	12.5	668	17.6	363	17.7
Textiles	578	12.3	186	6.0	816	21.6	433	21.1
Wood	21	0.4	14	0.5	54	1.4	63	3.1
Pulp & paper	117	2.5	21	0.7	243	6.4	86	4.2
Chemicals	190	4.0	131	4.2	185	4.9	0	0.0
Rubber & plastics	180	3.8	85	2.7	42	1.1	117	5.7
Other non-metallic minerals	139	3.0	62	2.0	50	1.3	11	0.5
Metals	175	3.7	119	3.8	80	2.1	0	0.0
Machinery & equipment	295	6.3	57	1.8	283	7.5	88	4.3
Electrical & optical	1535	32.7	1295	41.8	695	18.4	554	27.0
Transport equipment	865	18.4	728	23.5	572	15.1	291	14.2
Other	88	1.9	12	0.4	98	2.6	44	2.1
Total manufacturing	4699	100.0	3098	100.0	3784	100.0	2048	100.0

Source: InvestNI

- 3.47 There has been a decline in the number of jobs promoted in all sub-sectors but particularly in the food and textiles industries. Electrical and optical was the dominant investment sector during the period 95/96 – 01/02, a reflection of the high tech boom. However there have been few jobs promoted in this sector since the end of the high tech boom in 2001.
- 3.48 Cross-referencing the jobs promoted / safeguarded by sector with the 3 digit growth sectors presented in Annex B. As whole, the data on jobs promoted does map with the potential growth opportunities for the future, while the relationship with jobs safeguarded is less obvious as expected.
- 3.49 In future, Northern Ireland may attract relatively fewer manufacturing jobs through new FDI. The increasing attractiveness of low cost locations in Eastern Europe, some soon to be within the EU, and in the Far East is likely to diminish Northern Ireland's success in attracting FDI in manufacturing. Although the Republic of Ireland, with costs similar to Northern Ireland, continues to attract manufacturing firms, this is primarily due to the important advantage of low corporation tax.
- 3.50 Although it has been stated that there is a need to compete for investment on a basis other than cost, for example quality, it is interesting to note the return in terms of investment that Republic of Ireland has accrued as a result of cost competition on the back of favourable taxation policy.

Conclusions

- 3.51 The analysis of recent trends has provided a number of interesting conclusions. Although manufacturing employment is in long term decline throughout the UK, Northern Ireland has lost proportionally fewer jobs than GB. As a result, Northern Ireland has steadily increased its share of UK manufacturing employment. However, it still has a manufacturing sector that is proportionally smaller than most GB regions. Northern Ireland's record is particularly good outside the declining textile and clothing sector, with considerable job creation, especially over the post cease-fire period since 1995. Analysis of redundancy data suggests at least 2,000 manufacturing jobs have been created on average, each year since 1998 despite the well documented difficulties. A downturn since 2000 coincides with the collapse of the high-tech boom and is expected to be temporary.
- 3.52 Although manufacturing employment has provided a valuable source of additional jobs in areas of formerly high unemployment within Northern Ireland, the evidence suggests that manufacturing is associated with less prosperous rather than more prosperous areas. Over the last 30 years manufacturing employment has fallen from over 180,000 to 90,000 compared to positive growth in services. This may be an argument for re-assessing policy for the promotion of manufacturing in these areas Northern Ireland.
- 3.53 However, the analysis also shows that while employment has been in decline in the region, output has performed considerably better. From 1996 to 2001 manufacturing output consistently grew with the exception of one quarter. Since Q2 2001 the level of output has remained relatively stable. In addition, over the period 1998 to 2003, the number of manufacturing firms has also grown, albeit modestly.
- 3.54 At broad manufacturing sub-sectoral level, Northern Ireland's manufacturing, outside the textile and clothing sector, has grown distinctly faster in employment terms than in GB. Although the evidence is mixed, there is data to suggest that this faster growth has also been reflected in something of a catch-up in labour productivity.
- 3.55 Analysis at 3 digit and 4 digit SIC sectors suggested that there were no clear messages for future growth sectors. However, regardless of the broad manufacturing sub-sector the evidence suggested there were examples of success and failure. This is also true in the contracting textiles sector where two 4 digit industries are among the top 10 employment growth sectors in Northern Ireland.
- 3.56 In addition, the analysis of wages showed that over the period 2000 to 2003, the average gross weekly earnings of labour fulfilling basic manufacturing processes, compared to those in skilled trade activities, have increased at a faster rate.

3.57 The evidence therefore suggests that opportunities exist in each broad manufacturing sector, however Northern Ireland's comparative advantage is more likely to exist in higher skilled production processes. Therefore industrial policy must be geared towards:

- identifying these niche areas of growth; and
- encouraging / supporting local business to make the shift to higher skilled and higher technological production processes.

3.58 Investment in manufacturing has fallen significantly as global conditions have worsened, but Northern Ireland's relative attractiveness is also under threat. The loss of Structural Financial Assistance after 2006 will have implications on attracting inward investment. As a result, Northern Ireland industrial policy must be designed to promote and foster a manufacturing sector that competes on skills and innovation. Policy must encourage expenditure in R&D, an outward looking focus and a business environment that attracts investment from world leaders.

IV Global trends in manufacturing

Introduction

- 4.1 This Section aims to build on the conclusions of the previous Section. It summarises the review of existing evidence on global manufacturing trends which is provided in full in Annex D. Given that the previous Section found that total manufacturing employment has been in decline across the UK for the majority of the last 3 decades while there continues to be opportunities in niche markets, this Section highlights recent developments in the sector internationally as well as presenting the aims of the UK's manufacturing strategy. In addition, given that the analysis in the previous Section found that manufacturing employment is loosely correlated with weaker regional economic performance, the review of the existing evidence provides a discussion of the drivers of economic growth. This Section then examines the potential components of a new manufacturing strategy, highlighting the challenges in Northern Ireland before offering suggestions for future industrial policy.
- 4.2 Therefore this Section takes the following structure:
- Manufacturing trends;
 - Key drivers of economic growth;
 - Components of a new manufacturing strategy; and
 - Best's suggestions for future industrial policy.

Manufacturing Trends

- 4.3 The evidence suggests that in the more advanced economies, the services sector has been growing more rapidly than industry and agriculture in the last two decades, while in the rest of the world, the most dynamic sector has been manufacturing.
- 4.4 From the literature we have identified some of the key drivers changing the nature of the manufacturing sector. These are summarised in Table 4.1 overleaf.

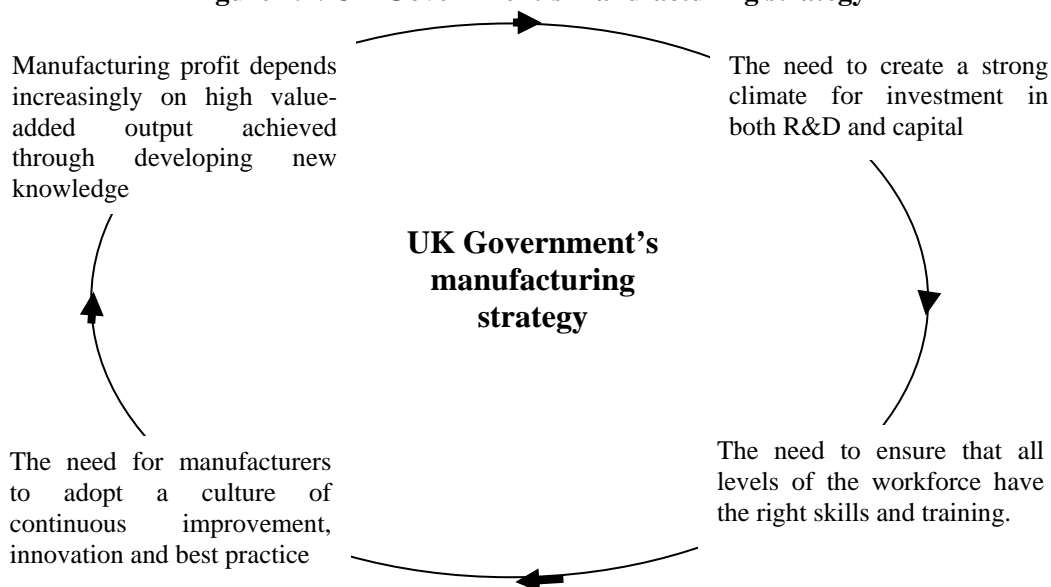
Table 4.1: A summary of global trends affecting the manufacturing sector

Drivers of change	Implications
Revolutionary changes in ICT	Changes in ICT are transforming every stage of the manufacturing process. These range from finding sources of research and applied development to use of the latest CAD techniques, to changing the relationship with customers and suppliers, to the way in which products can be marketed and sold;
The increasing pace of change in science and technology	Change is forcing manufacturers not only to invest faster than ever before in their next generation of products but also to keep abreast of the latest manufacturing techniques and processes in order to manufacture them competitively. ManuFuture (2003) state that the need for innovation is increasing, while the complexity of problems to be solved is growing. Advances in science and technology are particularly relevant in the fields of electronics, information technology and biotechnology. The development of new production processes based on research results, and the integration of thus far separate technologies, may radically change both the scope and scale of manufacturing;
Increasingly global competition	<p>Increased global competition also requires manufacturers to add more value in their production processes to stay ahead of the cycle and to compete against lower cost rivals. ManuFuture (2003) note that the international context is evolving, primarily due to the emergence of new actors in manufacturing and to economic fluctuations. How manufacturing companies will work in the future will depend even more on flexibility and speed as well as on localised production. Manufacturing is also likely to have become increasingly service-sensitive. This servation of manufacturing will have consequences for the organisation of production, supply-chain management and customer relations. In most manufacturing sub-sectors, global comparisons show that European manufacturing industry has been, and continues to be, successful in maintaining its leadership. However, this position is threatened in other countries by two factors:</p> <ul style="list-style-type: none"> • EU industry faces continuing competition from the other developed economies, particularly in the high-technology sectors; and • Low-wage economies are increasingly threatening the more traditional manufacturing sectors.
Changing consumer demand	Changing consumer demand, including for more sophisticated, customised and environmentally sound products, places new demands on manufacturing and R&D processes. ManuFuture (2003) note that customers' demands are increasing; in addition, individual needs have to be balanced with the necessity for products and production processes to be safe and eco-efficient.
Socio-demographic factors	Future manufacturing will be called upon to provide solutions to meet new societal needs and the demands of an ageing society. Concerning the labour supply, the manufacturing and research sectors will be confronted with the retirement of the current large age groups. Innovation may require new sets of skills, the availability of which, both in manufacturing and research, could become a critical factor in the sectors outcome.
Environment / sustainability issues	The manufacturing sector will have to comply with stricter environmental regulation in the future. Indeed markets may demand more environmentally friendly material and products. To realise efficiency gains, manufacturers may need to adopt energy and resource-saving technology. In addition, regulatory environment and standards may facilitate change in manufacturing sector. The intellectual property rights system might have to respond to changes in an innovation process that is increasingly based on knowledge sharing and networking. The adoption of new technologies in manufacturing will also depend on the availability of industrial standards and testing procedures to ensure reliable and interchangeable devices

Source: Based on DTI (1999) and ManuFuture (2003)

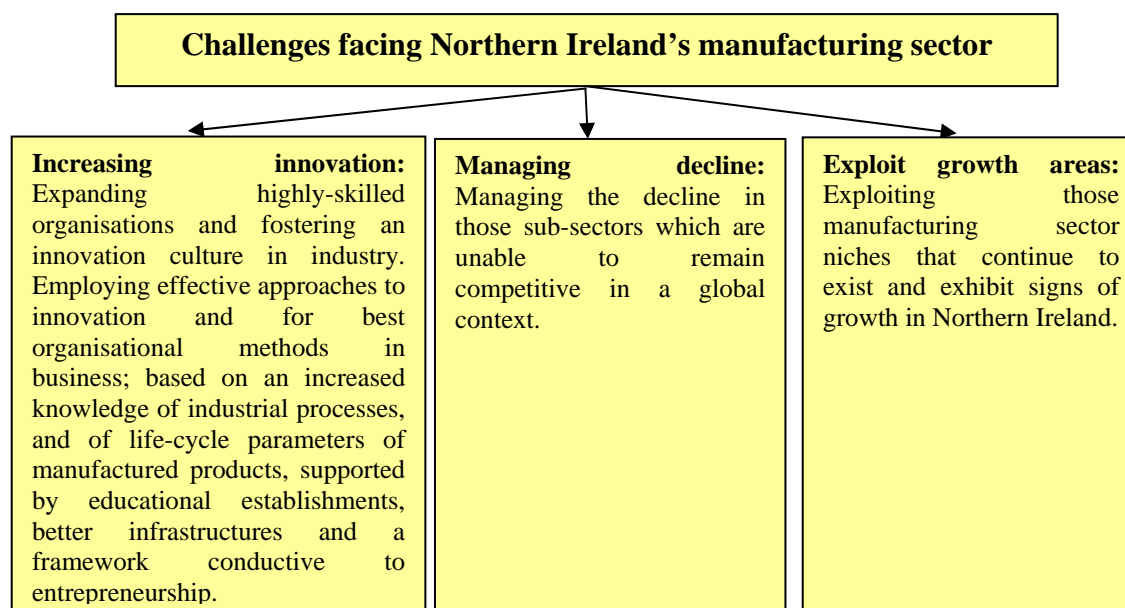
- 4.5 As a result of these factors, businesses in Britain that produce basic or commodity-like products using labour-intensive processes will find pressures they cannot resist from low-wage countries. In line with this, the UK Government's manufacturing strategy is designed to help more manufacturers to move up the value chain and to reap the benefits of high-skilled, knowledge-intensive manufacturing operations.

Figure 4.1: UK Government's manufacturing strategy



Source: Based on DTI (1999)

- 4.6 However evidence suggests that manufacturing cannot be simply outsourced while the higher paid employment in R&D, innovation and marketing is retained, as much of the prized higher income activity can also be performed equally well in lower cost countries.
- 4.7 These changes pose a number of significant challenges for the NI economy and the manufacturing sector (ManuFuture, 2003). It is important to encourage Northern Ireland's firms to move up the value added chain but on its own this is not enough. The diagram overleaf sets out some of the broad challenges facing Northern Ireland's manufacturing sector.

Figure 4.2: Broad challenges facing Northern Ireland's manufacturing sector

Source: Based on ManuFuture (2003)

- 4.8 If the manufacturing sector is to survive in Northern Ireland, it will need to remain competitive in a global market, through both productivity improvements in existing firms and by the development of new high value added niche sectors. There may also be scope for Northern Ireland to leverage opportunities off UK strengths. For example, the pharmaceuticals sector is seen as a growth area for UK manufacturing and could very well prove to be a potential area of opportunity for Northern Ireland.

The Pharmaceutical Sector: a growth area for UK manufacturing

All the world's leading pharmaceutical companies have significant manufacturing or research and development operations in the UK. DTI (2004) report that the sector employs 83,000 people across all business segments. In addition, the UK is the world's largest exporter of pharmaceuticals by value. In 2003, exports and the trade surplus hit record levels of £11.8bn and £3.1bn respectively. In addition, UK R&D spend totalled £3.5bn in 2003, exceeding by far that in any other European country.

It is also noted that the pharmaceutical sector has a global market, overwhelmingly in the developed world, worth around £250bn a year and a growth rate of 4% to 5% a year.

Source: Based on DTI (2004)

- 4.9 The discussion therefore shifts to consider the role and importance of productivity and the drivers of economic growth in not only the manufacturing sector, but in the economy as a whole.

Drivers of economic growth

4.10 As labour productivity growth accounts for at least half of GDP per capita growth in most OECD countries, the evidence suggests **that the target of industrial policy in Northern Ireland must be to raise the rate of productivity growth.** HM Treasury has identified the factors underlying regional and sub-regional economic performance as skills, innovation, investment, enterprise and competition and are the key factors driving productivity growth in UK regions and localities.

Table 4.2: Factors affecting regional and sub-regional productivity

Factors	Implications for productivity
Skills	These can be attributed to failures in the regional and local production of skills. Incentives to acquire human capital are reduced in low-growth regions by the lack of high-skilled jobs in such regions. In addition, market failures may exist in the matching of workers and their skills in a travel to work areas. These may be compounded by constraints on labour mobility.
Investment	Efficient investment decisions by entrepreneurs, banks, venture capital providers and other source of investment finance, require region and locally specific information. Depressed and remote areas may suffer from poor access to capital on account of a lack of information and uncertainty about investment opportunities in those areas.
Innovation	The dissemination of knowledge of best-practice and new technologies decreases with distance, suggesting that there is an important regional and local dimension to innovation. Tackling market failures in the adoption and creation of new technologies and best-practice techniques, on account of, for example inadequate product market competition or information failures, are vital to productivity growth in an area.
Enterprise	The sizes of labour, capital and product markets are all constrained by geography. High levels of entrepreneurial activity in every region and locality are essential for high levels of competition, innovation, investment and skills in an area – and hence for job creation and productivity
Competition	Markets can have an important regional and local dimension as they are segmented by transportation costs and consumer tastes. Ensuring that markets are competitive in every region and locality is essential in ensuring firms face incentives to innovate, keep prices down and minimise their costs of production

Source: Based on HM Treasury (2000)

The US perspective

In line with other advanced economies, manufacturing employment in the US has been falling over the past three decades. In the context of aggressive global competition the main challenges for US manufacturing are created by the emergence of new competitors, who have adopted the rules of a market economy, in place of the government planning systems (China and Russia in particular), further liberalization of trade and elimination of trade barriers, increasing costs of business compliance and a shift to global outsourcing.

The main characteristic of the modern manufacturing sector in the US is growth of productivity which exceeds that of America's strongest trading partners. This stronger performance of US manufacturing in raising its productivity gives some ground to believe in the sector's ability to adjust to increasing competition at home and abroad. Technological innovation is emphasised as one of the most important instruments for increasing productivity.

Other features that characterise the development of US manufacturing today are the significant retrenchment in business investment in technology, the uncertainty caused by terrorist attacks of 9/11 and dropping US exports due to slow economic growth in US main trading partners.

US manufacturing relies on productivity growth as a basis for recovery and development. Invention, innovation and product quality are used by US manufacturers to meet the competitive challenges.

Components of a new manufacturing strategy

- 4.11 The UK Government's manufacturing strategy requires a close partnership between government, industry management and the workforce (DTI 2002). The strategy identifies seven pillars to help build a vibrant, knowledge-intensive, high-skilled manufacturing base. These key elements for success are presented in the table below.

Table 4.3: The 7 pillars of the UK's manufacturing strategy

Factors	Implications for productivity
Macroeconomic stability	Elimination of boom and bust helps encourage an environment of steady growth and productivity improvement, giving manufacturing companies conditions where they can invest with confidence.
Investment	All sectors have an opportunity to narrow the productivity gap with their competitors by increasing investment in new technology, new products and advanced processes. The economy as a whole benefits when UK companies invest and foreign-owned companies decide to build manufacturing in the UK.
Science and innovation	To raise UK manufacturing innovation performance, by making best use of the excellent UK science base, by utilising technology from a range of sources, and by demonstrating the benefits which accrue to innovative companies. In particular, investment, skills and best practice, and close attention to customer needs, are essential if companies are to innovate successfully. Knowledge transfer activities can overcome information failures between business and the science base. The government has an important role in fostering innovation for example in encouraging R&D collaboration and knowledge sharing thus enabling individual companies to capture knowledge spin-off from each other's research, and collectively to enjoy the benefits of economies of scale and scope in innovation. Similar benefits can arise from policies to reinforce the development of clusters. By locating near each other, innovative companies engaged in related activities can gain spillover benefits whereby the innovation activity of one company benefits others;
World-class best practices	Adoption of best practice implies continuous improvement. Taken as a whole, UK manufacturers can increase their competitiveness considerably by adoption of world-class practices. As an indication of potential gains from learning from others, the CBI estimates that if UK firms adopted the best practice levels achieved by their international competitors, the UK could increase GDP by about £60bn.
Skills development	Improved skills across the workforce and the creation of a system that reflects the needs of individuals and employers are essential for the fulfilment of the Government's productivity and social inclusion agendas. The quality of labour input is a key driver of productivity growth, both in manufacturing and in the wider economy. Higher-skilled workers are better able both to exploit the potential of physical investment, and to adopt new ideas and interventions. Skill improvements complement other investments such as physical capital or R&D. If firms are unable to hire workers because of skills shortages, or if they cannot re-organise production, then their inability to undertake complementary investments may constrain their ability to invest in new plant and or more sophisticated machinery.
Strong infrastructure	The UK needs a modern, efficient public infrastructure to enable business to reduce costs, increase efficiency and improve competitiveness. The transport system is of central importance, together with a thriving broadband market due to the growing importance of e-business in all sectors.
The right market framework	The government wants the UK to be the best in the world to do business, a place where manufacturing innovates and thrives. This requires competitive and dynamic markets and motivated, well-informed and confident participants – business, consumers, employees and investors.

Source: Based on DTI (2002)

4.12 The overall aim of the strategy is to narrow the productivity gap, across the economy, with our major competitors. At a more specific level below this, targets for the UK include, for example:

- To increase the level of exploitation of technological knowledge derived from the science and engineering base, as demonstrated by a significant rise in the proportion of innovating businesses citing such sources;

- Of the firms assisted by Trade Partners UK, at least 15% of those new to exporting, and 50% of established exporters, should have improved their business performance;
 - To use Regional Selective Assistance and Enterprise grants to lever in £3.75bn of capital investment and create / safeguard over 75,000 jobs by 2008; *and*
 - In the business best practice and knowledge transfer areas, targets are set rigorously at sub-programme and project level. Each industry forum programme has targets tailored to the sector concerned, for example, and each LINK programme has targets tailored to the particular technology which is being promoted.
- 4.13 DTI's 2004 report reviews the manufacturing strategy two years on from its inception. It notes that although major improvements have occurred across all the pillars, there is still plenty to be done by Government and industry (see Annex D for a more detailed discussion).
- 4.14 With regards current policy / actions in Northern Ireland to assist and support the manufacturing sector, we have summarised these under the pillars of the UK strategy.

Table 4.4: A summary of Northern Ireland manufacturing strategy

Factors	Actions / policy
Investment	<p>Companies are being helped to build their capability through R&D, innovation, technology transfer, marketing and skills development. The agency provides tailored business solutions and where finance is needed helps its clients explore commercial avenues before using public resources.</p> <p>Invest NI is committed to the development of a vibrant local venture capital market. It recently published Venture Capital – Out Approach, explaining the need for Government intervention at an institutional level, where necessary facilitating the creation of new venture capital funds; and also at an individual company level, through direct equity participation, to address any remaining gaps in the market.</p>
Science and innovation	<p>Think create innovate: The Regional Innovation Strategy for Northern Ireland, was published in June 2003, with the objective of co-ordinating and sustaining a systemic approach to innovation and R&D across all sectors of the economy and society with the overarching objective of making Northern Ireland a genuinely world-class innovating region. It sets out four key priorities:</p> <ul style="list-style-type: none"> • To create a coherent R&D and innovation infrastructure; • To enhance the use of R&D and innovation by the business sector; • To develop a culture of innovation and enterprise; and • To sustain the regional innovation system. <p>The research & Technological Development Centre of Excellence Programme has established 18 company and University-based Centres of Excellence, with investment of over £100m in both established and emerging technologies, including electronics, communication and IT and nanotechnology.</p> <p>In addition, 3 funds specifically support innovation and knowledge transfer:</p> <ul style="list-style-type: none"> • The Proof of Concept Fund supports the development of ideas from university R&D into industry; • The Higher Education Innovation Fund will promote and support an enhanced university . industry interface; and • The NITECH Fund is designed to increase the level of knowledge and technology transfer into the commercial environment. <p>An enhanced action plan now sets out a strategic framework and a prioritized list of initiatives to demonstrate the benefits and applications of design principles to at least 150 companies through events, case studies and the media.</p> <p>24 Knowledge Transfer Partnerships help businesses develop and grow by accessing knowledge and expertise in UK universities, colleges and research organizations. A further five are under negotiation.</p> <p>Partnerships are being promoted between Northern Ireland universities and international research institutions through Technology Missions (for example a telecommunications mission to Asia and nanotech missions to Boston and Tokyo have already taken place)</p>

Factors	Actions / policy
World-class best practices	<p>Invest NI has supported the development of the UK Micro- and Nanotechnology network, to provide a forum for exchange of knowledge and best practice.</p> <p>Organisations with assistance from Invest NI, provides support for technology transfer in smaller companies in Northern Ireland. Its Technology Advisory Service helps small business focus on innovation and provides project management, monitoring and links with universities and further education colleges.</p>
Skills development	<p>The Department for Employment & Learning is developing a Skills Strategy and has reviewed Further Education and Modern Apprenticeships.</p> <p>Invest NI offer through their Company Development Programme and their People Excellence Programme, general advice and training for firms in areas such as legislation and human resources.</p>
Strong infrastructure	<p>An integral feature of Northern Ireland's Regional development Strategy was the production of Regional Transportation Strategy, with a Belfast Metropolitan Transport Plan and Regional Strategic Transport Network Transport Plan.</p> <p>Over £55m of Strategic Road Improvement schemes have been completed in the past two years, schemes to the value of £50m are currently under construction and further schemes to the value of £350m are expected to be built in the next 5 years.</p> <p>Northern Ireland has a full digital, fully fibre optic communications network providing a minimum of 2.5 Gigabits per second (Gbps) capacity expandable up to 100 Gbps. There are telecom links to the rest of the UK and Ireland by undersea and underground cables as well as radio and microwave technology providing secure, resilient and high capacity connections to the rest of the world. DETI has recently awarded a contract for the delivery of 100% broadband access to every business and household in Northern Ireland by December 2005.</p>

Source: Based on DTI (2004)

4.15 Northern Ireland's old system of preferential assistance to industry (e.g. Standard Capital Grants) has been blamed for preserving a fairly stable economy whilst effectively concealing the reality of eroding competitiveness. The low growth, low productivity, low innovation economy has had powerful self-reinforcing barriers to change. The literature has set out five challenges that policy makers need to address in order to advance the three elements of: business model, production capabilities and skills in Northern Ireland.

- **Establish entrepreneurial firms:** These firms pursue market niches by developing unique production capabilities, often of a technological form, which creates new market opportunities. They pursue product-led competitive strategies and depend upon high performance work systems;
- **Encourage open-systems networking:** Clusters of firms gain from spill-over effects from other firms' innovative activity. Discarded possibilities are often opportunities for new divisions within subsidiaries or spin-offs or for new firm creation. Northern Ireland has been dominated by a combination of a few large, vertically-integrated enterprises and small firms that supply to the local market. As a result, and the limited number of entrepreneurial firms, the degree of techno-diversity in Northern Ireland is limited;

Unexpected productivity performance. Case of Oberbayern in Germany

The European Competitiveness report of 2003 addressed the question of why industries in some regions are more competitive than others. The research presented in the report concluded that there are several factors that could contribute to more-than-expected productivity growth:

- government policy (including regional innovation strategy);
- entrepreneurship culture;
- cluster activity; and
- regional spillovers.

The region of Oberbayern in Germany is one of the examples of unexpected productivity performance. Manufacturing in Oberbayern covers traditional machinery and car makers but also new areas such as biotechnology and new materials. Services dominate the local economy but there is a distinct tendency to retain manufacturers by specially designed industrial sites / clusters, based on three main industries: ICT (grouped around Infineon, Siemens, Oracle and the Microsoft subsidiary), media (print, film, new media) and biotechnology. Resources for the creation of industrial clusters were provided by receipts of past privatizations of state-owned enterprises.

The region also created a policy framework to ensure economic success by providing adequate supplies of inexpensive energy, supporting the development of transport infrastructure, improving educational facilities and raising awareness of new technology development.

Cluster Development. Case of Emilia-Romagna, Italy

Emilia-Romagna is one of the Italian regions that experienced rapid growth based on SMEs and a number of dense clusters. The main characteristics of the clusters are the concentration of advanced human capital, social capital (attitudes to cooperate, exchange opportunities and information) and institutional integration and local-regional governance (active business organizations, efficient local governments, active trade unions).

Despite the context of lower educational levels, smaller public-private investment in R&D and capital markets than in other OECD countries the region has developed internationally competitive firms, gained wealth and achieved low unemployment. The key success factors for SMEs in the region are technical specialization, accumulation of sophisticated knowledge and openness, internationalisation and expansion of networks.

The textile cluster represents 18% of regional manufacturing employment and its strength is based on long experience and expertise in design and the use of information technology supported by entrepreneurship as a part of the local culture.

In the 1990s the cluster organization CITER started to promote the following main objectives:

- market intelligence collection;
- market analysis;
- technology diffusion, innovation promotion;
- supporting design activity;
- information about technical standards and assistance for certification;
- providing technical training; and
- participating in international projects and partnerships.

CITER was partly financed by the regional government and by the services CITER provided. The organization has its office in Capri with laboratories and other facilities. The project areas of CITER include: fashion, marketing, training, quality certification, international cooperation, software, technical analysis and external relationships. Each area, along with press and administration, has a person responsible and their backgrounds vary from technical to creative-artistic to meet different needs of clients and provide a wide range of services. The mission of CITER has been changing through time but the case proved to be successful and served as a basis for the creation of other similar technical centres.

- **Strengthen technological management:** In the new technology driven economy, technology management is about the capability to develop and introduce new technologies, machines, materials, techniques, and methods into production to improve production performance. Evidence suggests that the requisite production capabilities for a knowledge-driven industrial system on a scale to drive a high rate of growth are lacking in Northern Ireland;
- **Foster technology transition:** Successful firms have relatively high investment in R&D, designers and market researchers, and focus on building skilled labour. As a result they compete more on quality and less on price and are less vulnerable to competition from low cost producers, and from adverse movements in the exchange rate; *and*

Industry – Science Relations

There is an overall perception in Europe that there exists a gap between scientific progress and advancement, and deteriorating industrial competitiveness. This is often referred to as the “European Paradox”.

To address this issue research was undertaken (by European Commission, 2002a) within a specially designed benchmarking initiative to identify the possibilities for facilitation of relations and define a framework for Industry – Science Relations (ISR), including analysis of best practices in EU Member States.

The main findings of this research emphasize that policy-related framework conditions such as legislation, institutional settings in public science and promotion programmes foster the establishment and development of ISR. Key areas for policy intervention were identified in R & D collaboration programmes, addressing generic disadvantages of small enterprises in ISRs, institutional reforms in public science, connecting industry and science in training and higher education, and facilitating the commercialisation of new research findings via patents and start-ups.

The Strand report of the FutMan project (European Commission 2002b) emphasises that joint research between industry and academic institutions is crucial. This network will allow the industry to access break-through technologies, increase dialogues and exchange of ideas while allowing much needed R&D funds for academic institutions to explore new ideas.

- Encourage skill formation:** Economic evidence points to the benefits of cultivating continual skill development to enable knowledge-intensive manufacturing to yield competitive high value-added production. UK manufacturing appears to underinvest in training when compared with the rest of the economy. The University system in Northern Ireland has world-class research facilities in several areas but active industry / university partnerships are too few, as is active student involvement. Every successful rapid and sustained industrial growth experience is simultaneously an account of proactive and strategic institutional development of visible and invisible colleges of knowledge diffusion which is not adequately addressed in Northern Ireland.

Example of high value-added activity

Switzerland, with its high wage levels, won 31% of the global market for textile manufacturing equipment in 1997. This figure was double its global share ten years previously. The explanation again lies in capital and knowledge-intensive production techniques. High and sustained levels of spending R&D, followed by levels of investment necessary to turn these innovations into manufacturing success, led to productivity improvements that easily supported the wage levels set by the Swiss labour market.

Source: DTI (2002)

Examples of good practice

Joint research programmes, which promote direct collaboration between industry and science, are a well-established policy intervention mechanism. In this area, good practice particularly refers to thematically focused programmes which apply a bottom-up approach of defining joint research themes, have a long-term perspective of cooperation and rely, at least partially, on an ‘infrastructure’ approach, i.e. the establishment of institutions and/or facilities that are operated both by enterprises and science institutes and maintain cooperation after funding has ended.

Competence Centres in Sweden and Kplus in Austria

The basic idea behind the creation of competence centres is the concept that active involvement from industry in academic research brings about mutual benefits. From 1998 to 2000 the budget for the competence centre programme was about €53m, i.e. around 1% of Swedish R&D expenses. Participating universities and enterprises are each contributing one third of this amount. The program started in 1995 and at present comprises 28 competence centres at 8 universities and about 220 participating industrial companies. The competence centres are specialised in specific research fields within the following areas:

- energy transport, environmental technology (8);
- production and process technology (7);
- biotechnology and biomedical technology (5); and
- information technology (8).

About 20% of industrial partners are small and medium-sized firms (with less than 250 employees). Each centre is closely connected to the activities, long-term priorities and plans of a host university. The university has the responsibility for the centre administration and contributes to their financing by providing a base organization and other resources.

In Austria, the Kplus Competence Centre Programme is similar; however the consortia bidding for the grant are formed in a self-organized way between business and academia. In addition to the subsidies, some help is provided in the preparation phase of the proposal and the establishment of the organisation of the centre. Management advice is also provided throughout the duration of the project. Enterprises bear a minimum of 40% of the costs.

“An-Institutes” in Germany

Administrative framework and bureaucracy in Universities can impede interaction with industry. A German initiative has found the solution in the establishment of external institutes, An-Institutes, created to serve as “intermediaries” between universities and industry and enabled to take short decision paths and react to market demands and opportunities in flexible ways. An – Institutes may have completely private or semi-public structures, but in most cases they operate as non-profit institutions and pay lower taxes. They are officially acknowledged by Universities and operate under cooperation agreement. Some federal lands even have special rules and legislation for An-Institutes.

For interested companies, especially SMEs, An-Institutes are especially flexible unlike Universities with a variety of faculties and international institutes. This advantage allows them to be involved in regional networks and attract attention. They have good access to Universities and their basic research. Mostly all the directors of An-Institutes teach and undertake research at Universities. An-Institutes are able to offer excellent research opportunities to the students and often attract those with most potential. The activities of An-Institutes at Universities represent a considerable portion of technology transfer.

As a general rule, An-Institutes carry out research in areas close to science based industries (IT and microelectronics). The budgets of the Institutes vary: some receive funding from contracts with private clients and from projects for public clients, others totally rely on contracts for public and private clients.

Best's suggestions for future industrial policy

4.16 Best (2000) concludes that despite individual examples of success, Northern Ireland's business model is flawed, there are too few entrepreneurial firms while networks are underdeveloped. In addition, production capabilities, particularly technology management capabilities, require development and wider application. Furthermore, the skill formation process needs to be better planned. Best finds that Northern Ireland lacks enough entrepreneurial firms to propel regional growth, while open-system networking operates only on a very limited scale.

“An important goal in fighting against the perceived trend of ‘decline in manufacturing’ is to help generate long-term visions for the development of new manufacturing approaches in Europe. These should promote sustainable industrial growth and in improved quality of life for society as a whole”
(ManuFuture 2003).

4.17 NIEC (2000) believe that Best's report highlights five key strategic objectives which an economic development strategy for Northern Ireland should target:

- **Productivity:** The key focus of industrial policy has to be on driving up productivity. Policies should aim to build up a region's productive skills rather than merely allow it to bid for business more cheaply. The approach should cover both encouraging structural shift from low productivity to high productivity sectors and driving up productive capabilities within firms and industries through use of high performance work systems;
- **Innovation:** Sustained growth in productivity must be built on innovation. Process and, particularly, new product innovations account for 80% of productivity growth;

An example of intermediaries working for Manufacturing

The **Warwick Manufacturing Group (WMG)** based at Warwick University, is involved in publicly and privately funded research on innovation in products and manufacturing processes, with a focus on research, development and application for a range of industrial sectors – including research in areas such as logistics, manufacturing strategy, supply chain management, benchmarking and business process improvement. Research teams have academic and industrial backgrounds, and industry is closely involved in the delivery of its research, technology transfer and training programmes.

A programme between WMG, the Premium Automotive Group and Advantage West Midlands Regional Development Agency, with underpinning support from the Engineering & Physical Sciences Research Council, is working to ensure that every link in the automotive supply chain has access to the latest technologies and business techniques/

Source: DETI (2004)

- **Capabilities:** movement from less technology and skill intensive sectors to more complex and knowledge intensive sectors involve transitions to technology management capabilities based on more advanced principles or production;
- **Entrepreneurship:** To inspire a wider culture of entrepreneurship will require close cooperation between departments with responsibilities for economic development and education; *and*
- **Outward focus:** it is clear that to be competitive a small economy like Northern Ireland must be outwardly focused, tapping into world best practice through the development of networks and partnerships and through a targeted approach to inward investment.

4.18 Best (2000) concludes by presenting a number of proposals to guide industrial policy in Northern Ireland. These include:

- **Apply the principle of systems integration:** the notions of business model (entrepreneurial firms and open-system networking), production capabilities and skill formation need to be addressed together, not separately;
- **Concentrate on Entrepreneurial firms:** many will fail, but in the process the region's capabilities and skill base are advanced and new growth potential is created. Emerging firms benefiting from experiences and skills gained in previous entrepreneurial efforts may well reap the rewards;
- **Diffuse high performance work organisation;**
- **Foster open networks:** in a small region like Northern Ireland, this will mean partnering with enterprises located in other regions. Investing in networks, instead of companies, means that the industrial policy-making agency is not dependent upon the successful introduction and implementation of new principles or practices in any single firm;
- **Develop technology management capabilities:** this powerful policy tool for industrial policy-making is missing from the vision documents in Northern Ireland;
- **Integrate technology management and skill formation:** Northern Ireland's education system is a source of potential competitive advantage. Every entrepreneurial firm has access to the skill base and R&D partnering capabilities the university system offers. However, most of the research centres are highly under-utilised. Over the years, the university system has produced thousands of highly skilled professionals that work in and run entrepreneurial companies elsewhere. This is a strong asset that has yet to be converted into a regional capability;

An example of intermediaries working for Manufacturing

The **Institute for Manufacturing**, part of the University of Cambridge, works closely with industry providing education, research and practical support to companies of all sizes and across sectors. There are around 150 staff and researchers and a wide international academic and industrial network operating through a series of Centres and programmes.

- Key centres cover Strategy and Performance, Technology Management, International Manufacturing, Distributed Automation and Control, Production Processes, Economics and Policy;
- An Industry Links Unit delivers an annual programme of over 80 events, workshops and seminars and a portfolio of tools to help manufacturers improve performance; and
- The Manufacturing Leaders Programme and Automotive Leaders Programme prepare high potential managers for general management positions.

Source: DETI (2004)

- **Partner with firms bringing inward investment to advance capabilities:** inward investment should be assessed in terms of advances in the business model, production capabilities, and skill formation.
- **Link visible and invisible colleges:** Regional technology colleges have played a key role in industrial growth in the Republic of Ireland. Linking Further Education in technical skill development with research activities at university level could enhance the growth impact of both levels of education in Northern Ireland; *and*
- **Administer the research, technology development, and innovation infrastructure:** industrial policy to support long-term growth in high-income regions involves government funding commitments in research and technology infrastructure. Developing governance capabilities for integrating university research, technology development and industrial innovation is the heartland of industrial policy in knowledge-intensive industries.

4.19 The challenge is to devise a successful strategy to develop domestic manufacturing firms in high value added sectors with the capacity to sell nationally and internationally, while maintaining the stock of new and existing inward investment in manufacturing. In addition, there needs to be an impetus on re-skilling those previously in traditional sectors so that the demand of high-tech manufacturing is match by an adequate supply of skills.

Conclusions

4.20 The evidence suggests that in the more advanced economies, the services sector has been growing more rapidly than industry and agriculture in the last two decades, while in the rest of the world, the most dynamic sector has been manufacturing. The key drivers changing the nature of competition have been identified as:

- Revolutionary changes in ICT;
- The increasing pace of change in science and technology;
- Increasing global competition;
- Changing consumer demand;
- Socio-demographic factors; *and*
- Environment / sustainability issues.

4.21 As a result, the UK Government's manufacturing strategy is designed to help more manufacturers to move up the value chain and to reap the associated benefits. However existing evidence suggests that manufacturing cannot be simply outsourced while the higher paid employment is retained, as these activities can also be performed equally well in lower cost countries.

4.22 As labour productivity growth accounts for at least half of GDP per capita growth in most OECD countries, the evidence suggests that the target of industrial policy in Northern Ireland must be to raise the rate of productivity growth. Evidence about the factors underlying regional and sub-regional economic performance suggests that skills, innovation, investment, enterprise and competition are the key factors driving productivity growth in UK regions and localities.

4.23 Northern Ireland's old system of preferential assistance to industry (e.g. Standard Capital Grants) has been blamed for preserving a fairly stable economy whilst effectively concealing the reality of eroding competitiveness. In addition, the low growth, low productivity, low innovation economy has had powerful self-reinforcing barriers to change. However as the previous Section found, there are opportunities for local business across all manufacturing sectors. Intuitively, the traditional production techniques would achieve this success or growth. As a result, the literature has set out five challenges that policy makers need to address in order to advance the three elements of: business model, production capabilities and skills in Northern Ireland:

- Establish entrepreneurial firms;

- Encourage open-systems networking;
- Strengthen technological management;
- Foster technology transition; *and*
- Encourage skill formation

4.24 These challenges are key to ensuring that local businesses successfully shift to higher technological production techniques, based on a strong skills base, which incorporate innovative solutions and products. However, there is also a need to encourage more business start-ups to move away from the reliance of grant aid. As a result the evidence highlights five key strategic objectives which an economic development strategy for Northern Ireland should target:

- Raising productivity;
- Encouraging innovation;
- Increase technological capabilities;
- Inspire entrepreneurship; *and*
- Foster an outward focus.

4.25 In order to achieve these targets, it is our belief that proposals to guide industrial policy in Northern Ireland should be structured around the wider manufacturing strategy for the UK. In particular they should be developed under 6 of the 7 pillars of the UK strategy, with macroeconomic stability being outside our control.

V Views of the Sector and Government

Introduction

- 5.1 The analysis of recent trends and the literature review highlighted that although the manufacturing sector is in decline across all developed economies, there is still scope for future growth in high-value added niche areas. In addition, the previous findings have shown that although manufacturing productivity has been growing, the UK and Northern Ireland remain somewhat behind their main competitors. Perhaps a result of the system of preferential aid during the 1980's and 1990's in Northern Ireland, or perhaps a result of global trends or both, the evidence so far suggests that the manufacturing sector requires policy that will encourage a dynamic, innovative sector based on new technology, expenditure on R&D and a high skills base. The future of Northern Ireland's competitive advantage will have to be on a non-cost basis.
- 5.2 This section presents the key findings from the views of 162 local manufacturing firms and those from over 10 interviews with manufacturing sectoral organisations, Government Departments and Agencies on the manufacturing sector. It aims to build on the evidence presented so far and provide an insight into how, the industrial representatives / agencies, the individual firm, and the Government view the sector and how they should respond to current trends.

Key findings from the manufacturing survey

- 5.3 This section presents the key findings from the manufacturing survey. The charts are presented in Annex E. From the 162 manufacturing firms surveyed, it was found that:
- **Operating costs are high:** The majority of those surveyed (84%) felt that the costs of operating their business in Northern Ireland had increased. Insurance was cited as having the largest increase, with Labour, Energy and Transport also experiencing large growth. Furthermore exactly half felt that their costs were likely to continue to increase over the next 12 months. In addition, only 53% of companies reported an increase in profits;
 - **Mixed response to abolition of industrial de-rating:** Nearly 30% of firms surveyed felt that they would explore cost savings in other areas of business if industrial derating is abolished. A further quarter of respondents felt that would do nothing while 16% felt that they would reconsider investment decisions. Only 18% responded that they would close the business (9%) or reduce the scale of the business (9%);

- **Moderate increase in manufacturing employment:** it was found that on the whole, companies had increased or kept constant the level of employees at all stages of the manufacturing process;
- **Cost base and downturn in business important:** nearly two thirds of firms highlighted the need to drive down the cost base as a reason for reducing admin employment. In addition, nearly half of respondents reported driving down the cost base as a reason for reducing Corporate employment. Furthermore, between a quarter and a third of firms cited a downturn in business as a reason to reduce corporate / admin / basic manufacturing employment;
- **Little evidence of relocation:** Over half of respondents were unaware of other companies relocating or expanding in the past 12 months. In addition, nearly 90% of respondents have not relocated themselves. Of those that have relocated or expanded, nearly three quarters involved basic manufacturing / processing;
- **Majority of relocation or expansion in ROI and UK:** Of the relocation / expansion over a third occurred in ROI with an addition 31% in the UK. Only 3% reported any expansion or relocation in the EU or accession countries;
- **Low likelihood of future relocation / expansion:** Over two thirds of respondents have no plans to relocate or expand outside Northern Ireland. Of those who do plan to expand or relocate, 83% will be basic manufacturing / processing;
- **High awareness of services available from Invest NI:** 83% of those surveyed felt that they knew of the services offered by Invest NI;
- **High degree of contact with Invest NI:** over two thirds of respondents had either applied or received assistance from Invest NI. Of the 31% that did not apply or receive assistance, 27% did not need it. Only 5% were unaware of what was on offer;
- **Firms want a reduction in red tape:** over half the manufacturing firms reported that they would like government to reduce red tape in order to help their business, with improvements in transport infrastructure the second most popular with 17%.

5.4 An important element of Northern Ireland's manufacturing sector is its structure. As can be seen, 64% of respondents reported that their firm was family owned. As a result, this type of structure has important policy implications. The Mittelstand in Germany is good example of how family owned businesses can create considerable wealth creation and employment.

Lessons of Mittelstand, Germany

The term 'Mittelstand' is used to describe the small and medium firm sector in Germany. There is no specific definition of the sector, but one widely used is firms with revenue under €50 million or firms with under 500 employees. Using these measurements, enterprises with annual revenue of less than €50 million account for 43.2% of total revenue of all firms. Those with less than 500 employees make up 78.4% of total employment.

The concept of the owner/entrepreneur plays a very important role in the Mittelstand, and he/she is usually the driving force behind the firm. The companies usually exist as limited liabilities or sometimes as non-incorporated firms, where transparency requirements are less strict. Many have a niche and produce one good, or a very specific range of goods. Mittelstand firms account for 22.6% share of the global market of the relevant product, and 31.7% of the European market.

Mittelstand firms account for much of the Post WWII German economic miracle. The importance of this sector is much more developed than in other similar sized economies. In 90% of all Mittelstand firms the entrepreneur holds the majority of shares. Where the firm is family owned, 80% of such firms own 100% of the shares. The sector is much more sensitive to political changes in taxation or regulation and is much more responsive to such changes than other sectors. The sector has not, however, witnessed the emergence of high-tech industries, which is worrying in the longer term.

There is a widespread reluctance to use venture capital and German SMEs have a low (although increasing) rate of equity capital (28.4%). Mittelstand firms rarely access capital through equity or debt markets, but instead develop close relationships with banks and rely on bank credit. Before German banks became more averse to lending, Mittelstand companies were able to engage in long term planning of investment, enabling solid and sustainable growth. The banking sector in Germany follows a much more 'corporatist' model of economic growth.

Productivity in Mittelstand firms is also much higher than similar sized firms in other countries. German SME productivity stood at 103% (measured as a proportion of average productivity) in 1996, higher than any other European country. Much of this can be ascribed to the entrepreneurial nature of the enterprises.

It is worth remembering that Germany also engages in major fiscal redistribution schemes, directly transferring revenue from regions with high income to those with lower income. Among other things, this money is used to stimulate growth in less economically productive regions, which undoubtedly benefits Mittelstand firms in these areas.

- 5.5 Although useful, the results of the survey highlight further areas of research. For example, of those firms which have relocated, over half reported ‘other’ as the main reason. Intuitively, it would be helpful if we could fully understand the reasons for relocation. In addition, it would also be useful to know exactly where the 45% of respondents who relocated to ‘other’, actually did locate.
- 5.6 Furthermore, it would also be interesting to capture respondents knowledge of the exact services available from Invest NI. It may be that firms are not aware of a substantial amount of Invest NI’s services. In which case the high awareness of services available from Invest NI is not reflective of the true picture.

Key findings from the consultations

- 5.7 As noted in the introduction to this Section, the following commentary presents the key findings from a series of key informant consultations. Over 10 sectoral organisations, Government Departments, and Government agencies were consulted. Their views on the manufacturing sector have been combined and summarised into the following 5 sub-sections:
- Current trends in manufacturing;
 - Future trends in manufacturing;
 - How the individual firm should respond;
 - How the sector should respond; and
 - How Government should respond;

Current trends in manufacturing

- 5.8 There was a consensus amongst those interviewed that globalisation has been the most obvious trend affecting the manufacturing industry, reinforcing the findings from the literature review. Many regarded China and India as the most attractive places for manufacturers to set up production, but some also suggested that the EU Accession countries would be appealing to many foreign investors due to their low wages, high skills and proximity to Europe (see discussion in Annex D).
- 5.9 Again, reinforcing the findings from the previous section, most agreed that improvements in IT have been central to the manufacturing industry, not just in terms of accelerating globalisation, but also because it affects almost every stage of production. CAD (Computer Aided Design) makes it easier to develop products, while EPOS (Electronic Point of Sale) provides manufacturers and retailers with more information about what customers are buying.

- 5.10 The advances in IT have raised the expectations of consumers who are demanding lower cost, higher quality products which are brought to market in a shorter time. Customers are also expecting increased customisation of products. One respondent noted that while Government has been moving towards standardisation, the consumer has been moving in the opposite direction.
- 5.11 Consultations with Invest NI highlighted that in the luxury markets, local firms have been successful. However in the volume markets, where products cost less, domestic firms have been struggling. It is this shift to the higher value unique products that is therefore the aim for firms in sectors such as textiles and giftware. Successful textiles firms are now reported to be involved in design and utilising high technology processes. Local business can no longer rely on basic manufacturing processes. In all sectors, it was reported that firms are moving away from standard products to tailored products. They are shifting from offering production only, to include R&D and innovation through to marketing, sales and after sales servicing.
- 5.12 Some of those interviewed noted that the supply chain is becoming shorter and more responsive. An increased focus on Just-in-time (JIT) production means that manufacturers are now expected to hold most of the stock and deliver exactly when the customer needs it. In some sectors, such as Aerospace, larger firms are also expecting suppliers to bear more upfront risk for new ventures.
- 5.13 The cost base of manufacturing is also becoming more capital intensive. As low value added jobs are moving overseas, there is an increased focus on the design and logistic stages of production. This has meant an increase in capital expenditure and a fall in labour costs. Invest NI respondents noted that in order for Northern Ireland's manufacturing sectors to remain competitive, productivity must be improved. However by investing in capital to improve productivity and consequently competitiveness, this often results in a reduction of employment (which can be seen in the statistics presented in Section III).
- 5.14 Many of those interviewed commented on the increasing burden of environmental legislation which has been introduced, and highlighted in the previous Section. While some regarded this legislation as an additional tax, others felt that in the long-run it would be beneficial to companies as it could force them to reduce their waste and become more efficient. The problem for Northern Ireland's firms is that some countries outside the EU do not face the immediate costs of environmental legislation, giving them a competitive edge.
- 5.15 Invest NI sectoral experts reported that due to changes in environmental legislation, the environment industries potentially offer very important growth markets. However it was also noted that these growth opportunities are always at the cost of other sectors.

- 5.16 Most of those who were asked, felt that the textiles and food sectors were likely to be the most vulnerable in the future, as they are at the forefront of globalisation. However some respondents also felt that any low value added jobs, regardless of the sector, were at risk (backing up the findings from both the analysis of recent trends and review of existing evidence).
- 5.17 Consultations with Invest NI however offered a more positive light on the Food sector. Over the last decade the sector has shown its resilience by surviving health scares such as BSE, the restructuring of the sector due to the emergence of the multi-national supermarkets and an uncertain political landscape with the suspension of the Assembly. According to Invest NI, during the BSE crisis, there were 30 companies in rescue. The fact that not one of these firms was lost is a sign of the flexibility and resilience of the sector. For example, the export market for Beef is worth £20m per year in Northern Ireland and has only just opened again.
- 5.18 According to Invest NI the explanation for not having many of the Food sub-sectors in the analysis of fastest growing sectors in Section III, was that most of the firms' strategies are not focused on employment. Instead turnover in the sector has been rising while employment has remained relatively stable. It was reported that sales in the sector have grown by around 5% per year recently. As a result, firms in the sector are mature, competitive, pursue product development and international sourcing. In addition, innovation is extensive in the sector with most of the key players carrying out testing and R&D in house. Furthermore, the sector is not particularly mobile due to the size of the plants unlike sectors such as Bio-tech.
- 5.19 It is also believed that there are growth areas in the sector. In particular, "functional foods" (such as those to do with dieting, nutrition, health foods and vitamin enriched products) and convenience food. Furthermore, it is believed that there is still potential for FDI in the sector. However it was also noted that although the sector has been growing in turnover and growth sectors do exist, the sector still faces risks. For example, another food scare could close a particular market.
- 5.20 In addition, it was also reported that the Food sector faces the threat of rising costs, in particular insurance costs (as highlighted by the manufacturing survey) and environmental costs. Insurance costs are a particular concern due to the construction and design of certain buildings. For example, following a death in a poultry factory in England, the Fire Service introduced a new policy that if one of these buildings catches fire, it will be left to burn, providing there are no civilians in the building. As a result, insurance costs in the sector have 'rocketed'. Furthermore, the recent publication 'Fit for market' made comparisons of labour costs in the food sector and showed that costs are higher in Northern Ireland than in the Republic of Ireland.

5.21 Many respondents found it very hard to generalise about how effectively Northern Ireland firms had responded to global trends. Some companies had been spectacularly successful at adapting to the changing environment, while others had been forced into change rather than welcoming it. While there was a suggestion that all firms were at least aware of the need for change it seems that almost all R&D expenditure in Northern Ireland is by a small number of companies, suggesting that many firms are still not investing enough to move up the value chain. Again, this provides some support for the argument highlighted in the review of existing literature, that a component of any new strategy for Northern Ireland should include a component of technological transition.

Future trends in manufacturing

5.22 In the future there will almost certainly be a continuation, or even an intensification, of current trends, especially with regards globalisation. The accession to the EU of Eastern European countries and a general reduction in tariffs and quotas in world trade will make it even easier for companies to move production around the globe to lower cost producers. However, some noted that there has been wage inflation in countries which have had traditionally low labour costs, so this may reduce the flow of manufacturing to these areas.

5.23 The pace of IT change will almost certainly continue, but the specific improvements are very difficult to predict. The convergence of different technologies are driving change, for example the lines between IT and telecoms is already blurred. This advance in technology will have a major impact on skills, requiring employees with the technical skills needed to deal with them. Again this provides support for the inclusion of technology management and skill formation (highlighted in the previous Section) in any new manufacturing strategy for Northern Ireland.

5.24 In the future it is likely that any low-value added jobs which have not already left Northern Ireland will do so. However, many respondents hoped that Northern Ireland firms could retain the higher value added jobs involving design and logistics while using IT to control production in other countries.

5.25 However, consultations with Invest NI identified issues with how best to measure wealth creation. For example is GVA the best measure or is it Profits? Furthermore, can Government make informed policy decisions based on GVA indicators? It was found through the consultations that which ever measure is used, problems arise. Invest NI use a function of exports, external sales, profits, salaries and number of employees as an indication of wealth creation. Research and development expenditure is also a good variable to measure potential wealth creation. In addition, local sourcing is very important, but hard to pin down. This suggests that any new manufacturing strategy requires a wide range of key performance indicators, perhaps those used for the UK manufacturing strategy, to measure the success of policy.

How the individual firm should respond

- 5.26 There was a general feeling that firms need to move to higher value added production and improve productivity, reinforcing the findings from the previous sections. These recommendations make abundant sense as it is difficult for Northern Ireland firms to compete on cost, but these general aims are difficult to implement in practice. To improve performance it was suggested that firms need to invest more in R&D, spend more time listening to their customers, and focus on niche markets.
- 5.27 Some of the larger manufacturing players in Northern Ireland are apparently experiencing pressure to out source to Eastern Europe and Asia. It was suggested that they struggle to see where Northern Ireland can compete outside niche areas and that the opportunities are in product development and product integration. At present in Northern Ireland, some local firms are undertaking new processes such as the implementation of technology coming from Japan.
- 5.28 Consultations, particularly with Invest NI note that the pressure from Eastern Europe will continue. The success of local firms will depend on their management. Companies need to find Niche markets where they can remain competitive.
- 5.29 Firms may face problems recruiting suitably qualified employees in the future, either because manufacturing is not seen by young people as being a growth industry, or because Universities and FE colleges are not liaising enough with industry to design suitable courses. To overcome this problem firms need to work more closely with educational institutions, keeping academics up to date with the latest commercial developments, while providing more feedback about what skills they need. One respondent suggested a regular forum which would assess the skills deficit in a systematic way. Again this supports the argument for including skills formation as a component of a future manufacturing strategy.
- 5.30 In addition, it was also reported that the industry should be working more closely with universities in order to undertake research and development and to diffuse knowledge.
- 5.31 It was also found that firms should be looking further a-field, trying to export more of their products even though, realistically, they are going to have a very small share of world markets. They should also analyse the market they are in and try to exploit any areas where they can respond quickly to customers, and provide specialised products. Again this supports Best's (2000) argument that an economic development strategy should include an outward focus.

- 5.32 It is essential for managers to be skilled in technology as it is such an important part of the manufacturing industry. Long-term survival cannot be based on doing more of the same, so employers need to be open to the introduction of new technology and innovations. Firms should also be developing a strategic leadership; for example the use of non-executive directors is below the level it should be in Northern Ireland. They can provide knowledge outside the sector and take a fresh look at what the business is doing. One of the key points that the consultations found, particularly with those in Invest NI was the benefit of a good management team. It was reported that a firm with the right management team, regardless of the sector, can survive.
- 5.33 Companies working on a cost basis rather than on a profit maximisation basis do not have control of their future. As a result, firms must look at their management techniques. However a potential weakness is Northern Ireland's business structure (highlighted above)². With such a high proportion of firms being family owned, there is reluctance in Northern Ireland to hand over power to new management. As a result it was felt that there needed to be a change in business thinking. One example was for firms across sectors to collaborate and share experience and best practice. In this way, local firms are more likely to be open than they would be with competitors.

How the sector should respond

- 5.34 All respondents agreed that there needs to be a more co-ordinated approach in almost all areas of business. There was a mixed response as to how effective clusters had been so far, but there was a general hope that they would be successful in the future. There was a feeling that anywhere that companies could work together, there was a potential to share best practice (identified in the previous section as a key element of an economic development strategy), find common solutions and improve efficiency.
- 5.35 In the aerospace industry there was a particular urgency for local companies to work together as firms like Boeing and Airbus are increasingly keen to work with regional alliances rather than individual companies. Some suggested that Northern Ireland firms should realise that they are competing against firms worldwide, rather than against other local organisations.
- 5.36 A co-ordinated approach to R&D would also be helpful, but the issues surrounding intellectual copyrights need to be resolved. There were also some doubts raised about the conflicting goals of academics, who may aim for producing respected research papers, and firms who are more focussed on profit. Again supporting Best's (2000) proposals to guide industrial policy in Northern Ireland.

² It is worth noting that Northern Ireland's business structure is also potential strength in that family owned businesses are less likely to move out of the region for low cost bases across the globe.

How Government should respond

- 5.37 It was found that the findings from the consultations provided support for the majority of the proposals, highlighted in the previous section, to guide industrial policy in Northern Ireland. There was a consensus that the Government was trying to help the manufacturing industry but that its implementation had not been as effective as it had hoped. There were some who suggested that, in line with the view in the previous Section that Northern Ireland's system of preferential assistance (e.g. Standard Capital Grants) had eroded competitiveness, the Government has been trying to sustain businesses which were unsustainable, when they should have been focussing on helping to transform them.
- 5.38 It was also asked by a number of respondents whether a manufacturing sector in an economy of 1.6 million people will survive? Northern Ireland is now totally reliant on Global changes and events. Historical roots such as the textiles industry will no longer play a part in the global market.
- 5.39 In addition, there is a value for money argument. Manufacturing requires more money relative to other industries to set up, and technological progress requires these companies to re-invest. It is impossible to forecast changes and developments in technology. As a result, the consultations found that companies that are operating have done so through change. Therefore the questions arise 'should Invest NI help firms manage change and do they need to treat the larger companies differently or lose our critical mass?' Regardless, it was stated that Invest NI need to understand companies to offer solutions to become internationally competitive.
- 5.40 There was general agreement that the one area where Government had been successful was in encouraging exports and strategic alliances. The trade missions run by Invest NI to different parts of the world were generally welcomed and should be continued in the future. It was felt that any expenditure on helping firms to expand their markets would show a good return on their investment. However it was noted by Invest NI themselves that around 80% of the companies taking part in these trade missions are the same ones time and again. Therefore more companies need to become involved in this opportunity.
- 5.41 Most people agreed that the Government had a role to play in encouraging co-operation between different firms and organisations. Despite the mixed success of clusters so far, any Government encouragement in future was welcomed. However, there were doubts expressed as to how well Government understood the potential benefits of clustering.

- 5.42 In a similar manner, co-operation between Universities, FE colleges and industry was widely encouraged both in terms of research and training. Inextricably linked to this was marketing of the potential benefits and the possibility itself of working with Universities. For example, one respondent suggested setting up a database which would allow companies to easily find details and contacts of academics or departments who were researching a field related to their business. Given that IntertradeIreland has recently launched such a database, the lack of industrial knowledge suggests that work may be required to raise awareness. Some also felt it necessary for Government to play a role in clarifying who owns particular rights when academics and industry work together. Some felt fiscal incentives would encourage links between University and industry would be of benefit to both sides.
- 5.43 In relation to training, it was suggested that the Government should encourage Universities to improve their commercial awareness, and allocate funding not just on student numbers but on the value of the degree, and its demand by employers. Establishing centres of excellence and encouraging co-operation between university and industry, not just for research but for knowledge transfer would also be welcome.
- 5.44 Most companies would like to see a general reduction in the burden of legislation. At the moment the bureaucracy of tax credits means that it can cost more, through audits and time, than the relief received. Employment issues such as paternity leave, national insurance increases and the minimum wage are all adding to the cost of business, but there is a realisation that many of these requirements are driven from the EU and the UK and it is very unlikely that there will be any changes in Northern Ireland.
- 5.45 There was widespread concern about the level of energy costs, particularly regarding both electricity and oil. It was also generally agreed that the derating of manufacturing companies will have a major impact on larger companies who will have to pay for large sites. Most respondents, while being realistic about what can be done, wanted Government to be at least aware of the extra costs that Northern Ireland firms face compared to other regions.
- 5.46 Consultations with Invest NI highlighted that there are number of key areas where government is trying to raise awareness. In relation to the Food sector, recommendations fall into four broad areas:
- Market understanding and penetration;
 - Fostering innovation;
 - Supply chain management and development; and
 - Capability development.
- 5.47 In relation to the textiles sector, Invest NI is encouraging firms to undertake / develop:

- Balanced outsourcing;
- Product development;
- Strategic alliances;
- Branding activities; and
- E-business.

5.48 Like those recommendations for the food sector, those for the textiles sector can apply across all industries. However it was noted that activities such as product development can take time and are not an easy process, while branding can cost a lot of money. However in today's competitive environment, they are essential to grow.

Conclusions

5.49 In conclusion, the findings from the manufacturing survey and the consultations complimented the findings from the literature review and the analysis of recent trends in Section III. Findings from the consultations supported the literature review in relation to the global trends affecting the sector. In addition, the views of the sector highlighted that respondents / key informants felt the competitive cost pressures are high in manufacturing and are expected to continue.

5.50 However it was found that on the whole, companies had not cut employee numbers suggesting that there are still areas for growth in manufacturing. Interestingly, over half of the 'food and drink' and 'other' companies surveyed reported increases in the number of employees in basic manufacturing in the last 5 years. However more importantly, a third of the textiles firms surveyed reported an increase in the number of employees in basic manufacturing. Where there had been a reduction in employment, the main reason was to drive down the cost base, followed by a downturn in business.

5.51 In addition, the evidence on relocation also compliments the findings from the literature review. Little evidence of relocation was found, however where it did take place, nearly three quarters reported that it was the low-value added basic manufacturing / processes. Furthermore, of those who reported plans to relocate, 83% was basic manufacturing / processing. Key informants also hoped Northern Ireland could retain the high value added jobs while the low value added jobs are likely to be lost.

5.52 Furthermore, the bulk of those surveyed felt they knew the services that are offered by Invest NI. Of the 31% who had reported not applying for assistance, only 5% were unaware of what was on offer.

5.53 In relation to the suggestions of how the individual firm, sector and Government should respond to the challenges, the findings support the five strategic objectives of an economic development strategy set out in the previous Section:

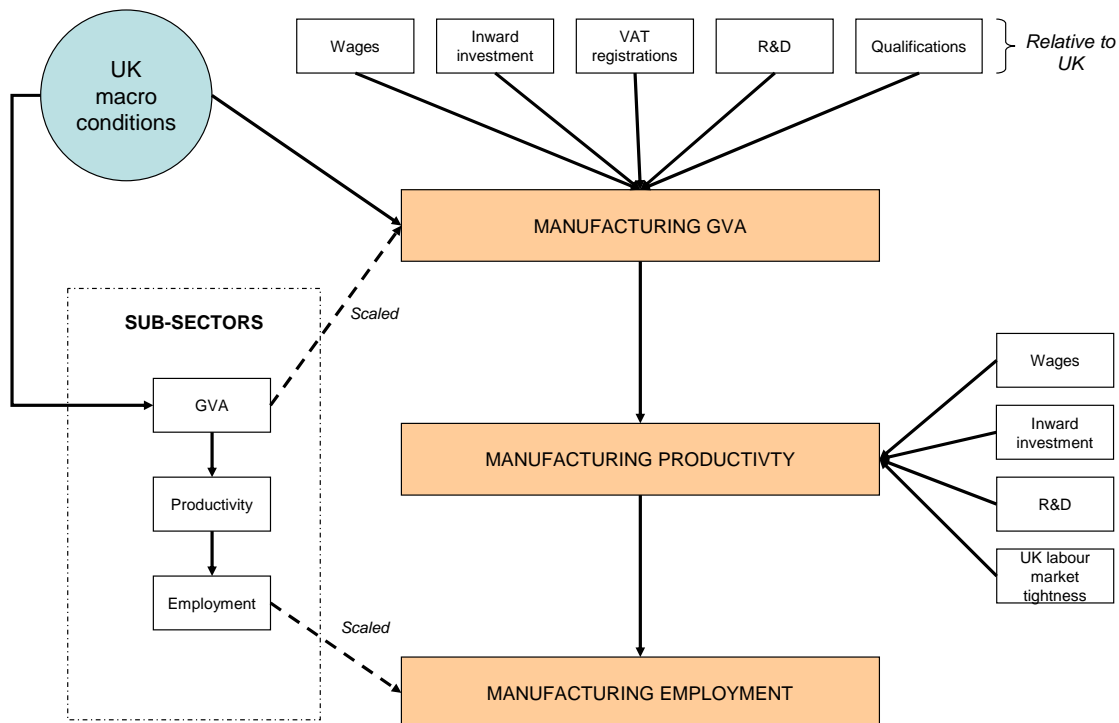
- **Productivity:** It was suggested that the individual firm needs to work more closely with educational institutions to keep academics up to date with the latest commercial developments, while providing feedback on skill requirements. In addition, it was felt that Government should encourage co-operation between Universities, FE colleges and industry in terms of both research and training. Furthermore, it was also suggested that Government should encourage Universities to improve their commercial awareness;
- **Innovation:** It was felt that firms need to invest more in R&D, spend more time listening to their customers and focus on niche markets. In addition, it was also suggested that a co-ordinated approach to R&D by the sector would also be helpful;
- **Capabilities:** It was suggested that the managers of individual firms must be skilled in technology as survival cannot be based on doing more of the same;
- **Entrepreneurship:** It was felt that the sector needed a more co-ordinated approach in almost all areas of business. Regardless of the mixed response to how effective clusters had been, there was hope that they would be successful in the future. It was also highlighted that the system of preferential assistance (e.g. Standard Capital Grants) had eroded competitiveness as Government had been trying to sustain businesses which were unsustainable, when they should be helping to transform them; and
- **Outward focus:** finally, it was reported that, the individual firm should be looking further a field to export their products. In addition, the Trade Missions run by Invest NI were successful and should continue.

VI Forecasts for the manufacturing sector

Introduction

- 6.1 The forecasts presented in this chapter are taken from the new Northern Ireland Policy Simulation (NIPS) model designed as part of the DETI/DFP funded Regional Forecasts project to monitor and forecast the Economic Development Forum (EDF) targets. The results of the first version of this model were presented in November 2004 and provide a more in-depth understanding of the NI economy than is available in the standard bi-annual Regional Forecasts/Oxford Economic Forecasting (OEF) Regional Economic Outlook. The model remains consistent with the overarching OEF UK macro trends which are generated by a detailed National Industry Model produced by OEF. The Northern Ireland forecasts are therefore considered within the wider group of UK regions and this provides a national and ‘industrial’ check to all of the forecasts presented.
- 6.2 The manufacturing projections presented in this chapter are based a model driven by national UK forecasts including forecasts of output in individual manufacturing sub-sectors. The broad structure of the key elements of the model in relation to the manufacturing sector is set out in the figure below (further details are provided in Annex A):

Figure 6.1: Structure of manufacturing block of NIPS model

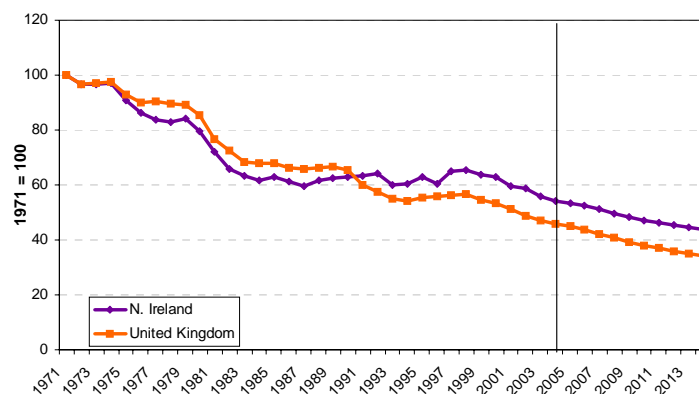


- 6.3 The NIPS model provides the ability run a range of scenarios and test policy implications through a range of adjustments. However the model has only been completed and a period of road-testing will be required before the full list of outputs is available. Nevertheless all the data produced below are from the run of NIPS model carried out specifically for EDF and the scenarios were specifically run for this project in mid November.

Employment projections

- 6.4 The outlook for manufacturing employment outlook is set out in the figure below.

Chart 6.1: Manufacturing employment, UK and NI: 1971-2014



Note: Employment includes employees in employment and self employed

Source: Regional Forecasts

- 6.5 The chart shows a forecast continued decline in manufacturing employment levels, both in Northern Ireland and in the UK, with 18,500 job losses forecast in Northern Ireland by 2014 (17,400 employees and 1,100 self employed). Northern Ireland is forecast to have 7% of the working age population employed in manufacturing by 2014, a figure close to the UK average. The employment level of 72,500 employed in manufacturing by 2014 is half the level of 1976.
- 6.6 Although large, this contraction, set out in the table below, is less than in all other UK regions over the same period.

Table 6.1: Forecast employment in manufacturing, UK regions: 2004-2014

	Change 04-14 (000's)	Change 04-14 (%)
West Midlands	-132.0	-29.9
Scotland	-77.3	-29.5
North West	-130.8	-28.2
North East	-45.0	-27.5
Yorks & Humber	-91.4	-25.6
Wales	-48.9	-25.5
London	-61.9	-24.6
East Midlands	-86.6	-24.5
South East	-101.2	-24.4
South West	-68.8	-23.1
East	-74.8	-23.0
N. Ireland	-18.5	-19.3
United Kingdom	-940.2	-26.0

Source: Regional Forecasts

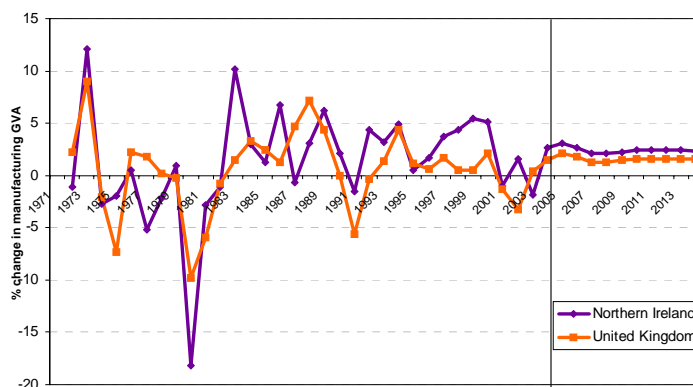
Note: Employment includes self-employment

6.7 The table shows Northern Ireland as the slowest contracting region over the forecast period, over 6 percentage points better than the UK average rate. This reflects Northern Ireland’s recent performance which has been better than the UK average. In addition it assumes that the phasing out of support to firms by 2006 will not drastically alter the contraction in employment. This view assumes that much of the funding to date has supported investment that would have been carried out regardless of government support. This issue is returned to further in the scenarios section of this chapter.

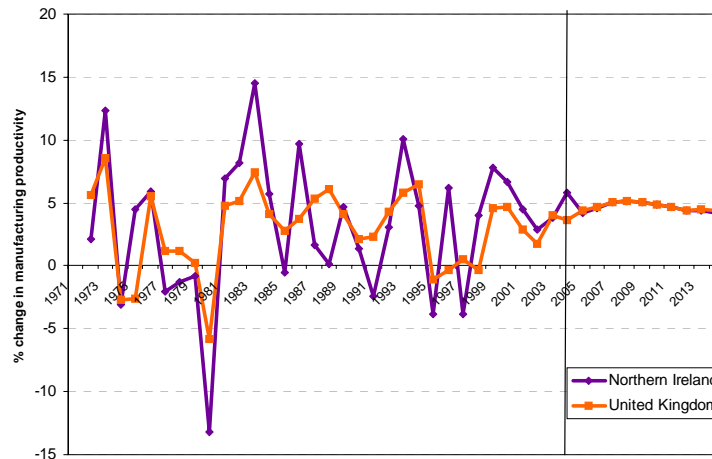
Output projections

6.8 Looking at GVA projections, a pattern of modest growth, slightly above the UK level is forecast, coupled with the employment contraction this reflects a continued increase in productivity. These trends are depicted in the figures below.

Figure 6.2: GVA forecasts, NI and UK: 1971-2014



Source: Regional Forecasts

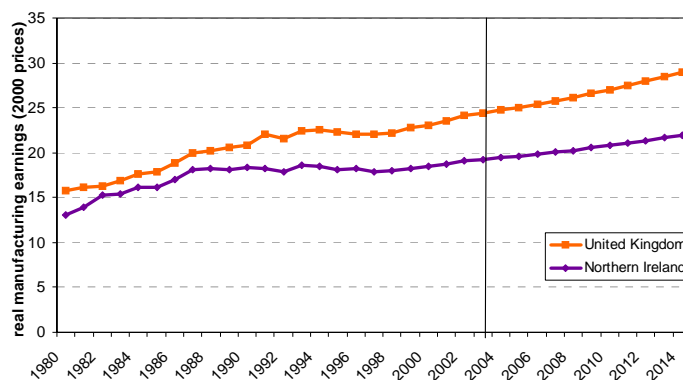
Figure 6.3: Productivity forecasts, NI and UK: 1971-2014

Source: Regional Forecasts

- 6.9 These figures suggest output growth returning towards longer term trends after struggling at the turn of the century. It is noticeable how less pronounced the fall in growth is in productivity between 2000 and 2002 compared to GVA. This is further evidence of the job shedding and closures brought on by difficult global conditions.
- 6.10 It is important to bear in mind the impact of potential data revision to these forecasts. The improvements in GVA and hence productivity may not be as pronounced if the ABI data discussed earlier prove to be accurate. The forecasts presented are based upon Regional Accounts data. Since there has been a significant difference in recent years between the GVA data and the raw ABI data on which GVA is based, the possibility of substantial data revision remains alive.

Wage projections

- 6.11 Wage forecasts suggest a continuation of modestly above inflation increases in wages, but with no erosion of the gap with UK wages. Indeed, a slight divergence is evident towards the end of the forecast period. The following figure sets out manufacturing wage forecasts for Northern Ireland and UK.

Figure 6.4: Wage forecasts, NI and UK: 1971-2014

Source: *Regional Forecasts*

- 6.12 Northern Ireland wage growth fell behind UK rates in the 1990s, with real Northern Ireland average wages actually declining by 1% over the decade compared to growth in the UK of nearly 10%. Improvements in growth since 1998 are at a similar rate to UK growth but the gap in real earnings remains at over 20% throughout the forecast period, rising to 25% by 2014. The 20% gap is larger than the corresponding figure from the New Earning Survey data, which suggests a gap of between 15% and 20%. This is due to the fact the forecast data is based on Compensation from Employees data supplied with Regional Accounts.

Sub-sectoral analysis

- 6.13 Detailed forecast charts for employment, GVA and productivity for each of the 13 manufacturing sub-sectors are set out in Annex F, but by way of summary the forecasts for employment and output are set out in the table below.

Table 6.2: Sub-sectoral employment and output forecasts, NI and UK: 2004-2014

	Per annum change in employment (%)		Per annum growth in GVA (%)	
	NI	UK	NI	UK
Food	-1.0	-1.9	2.1	1.1
Textiles	-6.6	-10.0	-1.4	-2.3
Wood	-0.9	-1.7	0.7	-0.2
Pulp & paper	-1.7	-2.4	1.9	1.0
Coke & oil	-3.3	-2.7	1.9	1.0
Chemicals	-2.5	-3.2	3.9	3.0
Rubber & plastics	-1.3	-1.7	2.8	1.9
Other non-metallic minerals	-3.9	-3.8	2.2	1.2
Metals	-4.0	-4.5	1.8	0.9
Machinery & equipment	-3.0	-3.4	2.0	1.0
Electrical & optical	-1.7	-3.3	4.4	3.4
Transport equipment	-1.5	-3.6	3.2	2.3
Other	-0.4	-1.1	1.6	0.7
Total manufacturing	-2.1	-3.1	2.4	1.6

Source: *Regional Forecasts*

Note: *Employees in employment*

- 6.14 The table reveals a very mixed outlook across sectors, with significant contraction expected to continue in textiles (as highlighted by the findings from the consultation) and, on a smaller scale, in heavy industry, namely metals and machinery. All sectors are expected to experience employment loss in Northern Ireland and the UK, but the strength of GVA growth across many sectors is striking, particularly in chemicals (highlighted as a potential area for further growth in the UK) and electrical & optical. As the overall forecasts would suggest, Northern Ireland outperforms the UK in virtually all sub-sectors over the forecast.
- 6.15 It is important when looking at GVA forecasts to bear in mind that these are based on Regional Accounts data. The raw ABI data suggests a more marked advance in GVA per employee in recent years. Hence, the improvement in relative productivity built in to the forecasts may well have already occurred. Since there is a degree of uncertainty about the accuracy of GVA data from Regional Accounts sources it may be prudent to attach more weight to the employment forecasts than to the GVA figures.

Scenarios

- 6.16 The base scenario presented is the most probable outlook for the sector, and sub-sectors, based on currently available data. This scenario suggests that recent relative productivity improvements in most Northern Ireland sub-sectors continue, through improvements in practices and loss of inefficient firms. The base scenario does factor in the potential loss of subsidies post 2006, though the actual impact of this may be less than expected as Northern Ireland will continue to have a number of other competitive advantages including low wages, good education outputs (at school level) and an existing skills base.
- 6.17 In addition, a buoyant UK economy operating near capacity is likely to provide some demand for Northern Ireland manufacturers. The highly cost competitive locations outside of the UK will be a considerable threat, though it is worth noting that these are a currently a threat and many UK regions continue to attract manufacturing investment. The impacts of slowing global inward investment levels and the threat of from low cost competition should not be confused when explaining the recent slow down in inward investment into Northern Ireland.
- 6.18 The base scenario predicts an overall contraction, as set out above, of 17,400 employee jobs by 2014. This contraction is relatively modest by UK standards and suggests Northern Ireland will have one of the most resilient manufacturing sectors in the UK despite the job loss. Two alternate scenarios are presented for future Northern Ireland manufacturing trends.

- 6.19 The main scenario builds in an assumption that inward investment in manufacturing will improve from its current level (of 73 jobs promoted in 2003/2004) to around 300 per annum over the forecast period. Although this appears to be a significant improvement. It is based on our national forecasts for an improvement in inward investment levels as the global economy improves. The forecast level of 300 jobs is consistent with data from InvestUK presented in the table below showing recent decline in Northern Ireland's share of new inward investment into the UK.

Table 6.3: NI share of new inward investment jobs into the UK (All industries)

	Northern Ireland	UK	NI % of UK
1995/96	1,350	17,024	7.9
1996/97	2,468	23,569	10.5
1997/98	662	15,948	4.2
1998/99	2,319	20,803	11.1
1999/00	244	26,952	0.9
2000/01	2,685	23,739	11.3
2001/02	153	11,199	1.4
2002/03	633	11,052	5.7

Source: Invest UK

Note: New inward investment job announcements into the UK and includes all sectors

- 6.20 While the table suggests that despite the pressures from low cost locations elsewhere, the UK has continued to attract new inward investment (albeit at historically lower levels) data relating solely to manufacturing highlights an un-encouraging Northern Ireland performance. Between 1999 and 2002 Northern Ireland's share of new manufacturing inward investment jobs promoted was only 2% of the UK total.
- 6.21 Two alternate scenarios were developed for this project based on alternate outlooks for inward investment, these are set out below:

Revived investment scenario

- 6.22 The revived investment scenario builds in an increased level of new inward investment job promotion into NI manufacturing of 1,200 in 2005 and 2006, with a fall to 800 per annum in the subsequent period reflecting less benevolent funding arrangements. This represents a higher level of inward investment than in the current climate but it is consistent with Northern Ireland's historical position relative to UK new inward investments. Reasons why such a return may not be implausible include:
- **Similar funding arrangements:** Though NI will lose its current funding capacity other regions will have a similar constraint and thereby NI's competitive position relative to other UK assisted regions will not deteriorate. Much will then depend on whether new inward investment into the UK continues at recent levels.
 - **Wage levels:** NI wages remain relatively low and hence provide a competitive advantage for manufacturing employers. The differential in wages is more than enough to offset any increase in transport costs and in an environment of similar

funding arrangements in the future this should provide a continuing competitive advantage for the region.

- **Rising costs in competitor economies:** The low cost alternative locations throughout Europe, and elsewhere, are growing rapidly and the cost advantage of lower wages may not remain as large as it currently is.

6.23 These factors, in addition to others, such as the uncertainty over exchange rate movements and the possibility of other forms of business support, make the view that all NI manufacturing will be uncompetitive in the medium term a pessimistic one to adopt.

Retracting investment scenario

6.24 The retracting investment scenario is based on the premise that reduced funding will have a more marked effect than is built into our base forecast. Historically InvestNI has reported manufacturing jobs promoted of approximately 4,000 per annum (though this did fall markedly in 2002 and 2003 to around 2,000). Although the view that the fall to 2,000 is temporary and a result of global investment conditions is subject to contention most national models do predict growth in investment levels.

6.25 The key issue in determining a low scenario is to assess what level of future investment will occur once government assistance becomes more restrictive after 2006. The belief that much of the investment supported in the past in existing Northern Ireland firms would have taken place in the absence of grants is built into the base case scenario. With 4,000 jobs promoted per annum, virtually all manufacturing jobs in NI are promoted by government funding every 20 years. In other words, without any funding there would be no manufacturing sector in NI in 20 years time. The evidence of other regions with much less funding, such as the West Midlands or South West suggest this is unlikely. This is particularly the case since relative costs are lower in Northern Ireland. Hence, there is a case to be made to suggest significant deadweight exists within the jobs promoted data for existing firms in Northern Ireland (but not for new inward investment). The low scenario sets out a model where deadweight is much lower than is inherent in the base case and in the scenario NI loses 1,000 jobs per annum in the short term rising to 2,000 in the medium term as result of the removal of funding support.

6.26 Running the two simulations in the NIPS produces the following forecasts.

Table 6.4: Manufacturing employment projections (000's), alternative scenarios, NI: 2014

	Base	Low investment	High investment
Food	16.9	12.7	17.3
Textiles	3.8	1.7	3.8
Wood	3.3	2.2	3.5
Pulp & paper	5.3	4.2	5.5
Coke & oil	0.1	0.1	0.1
Chemicals	2.6	1.6	4.0
Rubber & plastics	6.2	5.2	6.7
Other non-metallic minerals	3.8	2.8	4.3
Metals	4.2	3.2	5.1
Machinery & equipment	4.7	3.7	5.6
Electrical & optical	8.4	5.2	10.6
Transport equipment	9.3	6.1	10.1
Other	3.9	2.8	4.8
Total	72.5	51.4	81.3

Source: Regional Forecasts

Table 6.5: Manufacturing employment projections, alternative scenarios, NI: change (000's) 2004-2014

	Base	Low investment	High investment
Food	-1.8	-6.0	-1.3
Textiles	-3.7	-5.8	-3.7
Wood	-0.3	-1.4	-0.1
Pulp & paper	-1.0	-2.0	-0.8
Coke & oil	0.0	0.0	0.0
Chemicals	-0.8	-1.8	0.5
Rubber & plastics	-0.9	-1.9	-0.4
Other non-metallic minerals	-1.9	-2.9	-1.5
Metals	-2.2	-3.2	-1.3
Machinery & equipment	-1.7	-2.8	-0.8
Electrical & optical	-1.6	-4.8	0.6
Transport equipment	-1.5	-4.6	-0.6
Other	-0.2	-1.2	0.7
Total	-17.4	-38.5	-8.6

Source: Regional Forecasts

**Table 6.6: Manufacturing GVA and wages projections
alternative scenarios, 2004-2014**

	Base	Low investment	High investment
Real manufacturing GVA (£m)	4871	3849	5859
Real manufacturing GVA per employee (£000's)	67.2	74.9	72.1
Average real manufacturing wages (£000's)	29.9	29.9	30.0

Source: Regional Forecasts

- 6.27 The tables reveal a range of alternate outlooks for the sector as a whole. In the **higher scenario** Northern Ireland manufacturing declines more modestly over the forecast period largely as a result of the more positive outlook for the chemicals and electronics sector, and to a lesser extent the heavy industry sectors, metals machinery and transport and equipment. The electrical and optical sector expands to 10,600 in this optimistic scenario, over double the low scenario level. By 2014 the higher forecast is for just over 81,000 manufacturing employees, still a significant decline on current employee numbers. The more positive outlook for higher value added sectors results in a higher manufacturing GVA per employee figure than in the base scenario (£72,000 compared to £67,000 in the base case). It is our view that this scenario is improbable due to the erosion of Northern Ireland's competitive advantage. The threat from low cost alternatives in Eastern Europe and elsewhere (including the taxation favourable ROI) are likely to limit Northern Ireland's capacity to attract large scale inward investment. As a result, the levels of inward investment experienced in the 1990's are unlikely to return. Nevertheless it is a useful scenario to gauge the overall impact of the successful attraction of an increased share of expected UK inward investment.
- 6.28 The low growth scenario reflects a much more worrying outlook for the manufacturing sector and depicts an economy operating without any significant new inward investment and a decline in investment within existing Northern Ireland firms (both indigenous and foreign owned). As set out in the scenario description, this scenario assumes a lower proportion of deadweight (50% or more) in existing funding support than is built into our base case. This equates to a loss of around 4,000 manufacturing jobs per annum. Overall, this reduces the sector to 51,400 employees by 2014, equivalent to a loss of two fifths of the manufacturing workforce. Electrical and optical is hit particularly hard due to its present dependence on new investment and it is forecast to contract to 5,200 employees, almost 40% of its current size. Transport equipment and chemicals would also be severely impacted due to their investment dependence. The traditional sectors of food and textiles would also contract significantly. The significant decline in lower value added industries results in GVA per employee increasing to £75,000 per employee in the low scenario. **Although the likelihood of this scenario occurring is, in our view, limited, it is possible if the current subsidies offered to firms are proven to have lower levels of deadweight than we consider likely.**

6.29 Our scenario analysis suggests the risks are on the downside and a loss of 40% of manufacturing workforce in the next decade is a possibility depending on the path of inward investment and the impact of change in funding support. At best, the management of decline in the sector would appear the most positive outcome, with the fostering of new opportunities in as yet unidentified sub-sectors likely to be of crucial importance.

Niche markets

6.30 The analysis of recent trends revealed how certain industries had been successful in generating jobs over the recent past despite the overall decline in the manufacturing sector. As the scenario analysis suggested the decline of the overall sector, in employment terms, is almost inevitable but the opportunities in certain sub-sectors should not be overlooked. There are a number of important issues to consider when assessing the impacts of niche specialisms to the overall outlook for manufacturing:

- **Difficult to identify:** The future growth industries are probably not yet known as technological advances and inventions deliver new industries over time. This makes it impossible to predict their nature but speculative support for new industries, such as that offered by Venture Capitalists, is likely to be necessary to foster such industries wherever they are located;
- **Employment impact may be limited:** It is unlikely that Northern Ireland has the competitive advantage at present to attract the major manufacturing firms so even the appearance of many new niche industries may have a relatively small impact in employment terms. This is not to say that the impact on output or local economies may not be marked and as a result should not be overlooked; *and*
- **'Rules' may change:** Although our forecasts are based on a continuation of the current policy and legislative backdrop (including proposed funding changes) this may change. Rules over taxation policy both in Northern Ireland and elsewhere and the status of the EU with respect to funding policy may well impact the relative attractiveness of Northern Ireland as a location for manufacturing.

6.31 The development of opportunities against a backdrop of contraction is a challenging task for policy makers to support and it requires a flexibility, responsiveness and risk taking strategy more commonly found outside of the public sector.

Local implications

6.32 Taking the base case scenario for job contraction and translating it to District Council's (DC's) in Northern Ireland provides a useful barometer of 'jobs at risk'. Using manufacturing decline forecasts and assuming manufacturing contraction occurs equally across all DCs the following projections are arrived at.

Table 6.7: Indicative estimates of manufacturing job change, NI DCs: 2003-2014

	Estimated jobs at risk 04-14	% of working age population
Antrim	-650	-2.1
Ards	-600	-1.3
Armagh	-380	-1.1
Ballymena	-1,060	-2.9
Ballymoney	-260	-1.6
Banbridge	-310	-1.2
Belfast	-3,030	-1.8
Carrickfergus	-310	-1.3
Castlereagh	-660	-1.7
Coleraine	-610	-1.8
Cookstown	-390	-2.0
Craigavon	-1,790	-3.7
Derry	-1,290	-2.0
Down	-270	-0.7
Dungannon	-940	-3.3
Fermanagh	-610	-1.8
Larne	-370	-2.0
Limivady	-340	-1.7
Lisburn	-1,340	-2.0
Magherafelt	-610	-2.5
Moyle	-40	-0.4
Newry & Mourne	-760	-1.5
Newtownabbey	-1,060	-2.1
North Down	-390	-0.8
Omagh	-340	-1.2
Strabane	-520	-2.2
Northern Ireland	-18,940	-1.8

Source: Regional Forecasts

Note: Employees in employment

6.33 This clearly identifies certain areas as more ‘at risk’ from the projected decline than others. If 2-digit employment can be gathered at DC level a sub-sectoral model will be produced, providing more detail. Based on the manufacturing projections, Belfast, Craigavon, Derry and Lisburn stand to lose the most jobs due to the larger manufacturing sectors in job terms in these areas. In terms of overall impact Mid-Ulster areas would be the most severely impacted with farming areas and greater Belfast much less at threat (as the percentage column in table 6.7 highlights).

Conclusions

6.34 The forecasts suggest a number of important conclusions:

- The manufacturing sector as a whole is likely to contract in employment terms, both in Northern Ireland and elsewhere;
- The scale of this decline is likely to be in the order of just over 18,500 jobs (including self employed) lost;

- Productivity improvements will mean that overall GVA will continue to rise in the period to 2014;
- Not all sectors will be impacted equally with the most cost sensitive export sectors, such as textiles, metals and transport equipment most acutely impacted;
- Under a revived investment scenario, increased levels of new inward investment job promotion result in a more modest decline in manufacturing employment, driven by more positive prospects for the chemicals and electrical and optical sectors;
- The lower scenario, based on declining investment within Northern Ireland firms and no significant new inward investment, reduces the manufacturing sector to 51,400 employees with electrical and optical, transport and traditional sectors suffering heavy losses.
- It may be possible to generate some growth in a number of specialist niches despite the overall trend of employment decline though it is not possible to forecast these using a macro model; *and*
- Locally the impact of contraction will be relatively diverse with the data suggesting Mid-Ulster is most at risk.

6.35 The projections suggest that the management of decline at an aggregate level and support of niche and specialist 'new' industries is the task facing policy makers in Northern Ireland, and other regional authorities in UK. The outlook for investment remains crucial for the overall manufacturing prospects. The potential impact of the changes in funding available post 06 is also of importance when reviving the sectors prospects. The importance of manufacturing to output, exports and local prosperity should not be underplayed, nor the potential impact of continued employment contraction ignored.

VII Policy observations and recommendations

Introduction

- 7.1 In this report, we have sought to establish the context in terms of the current situation in relation to manufacturing industry in Northern Ireland, what the literature says about future trends, how local businesses perceive their future role and finally, our forecasts of future activity in the sector.
- 7.2 The aim of this section is to summarise the strengths and weaknesses already highlighted throughout the report and provide an assessment of the opportunities and threats to the manufacturing sector in Northern Ireland. This section then provides a discussion of the policy implications in light of the SWOT analysis before concluding with a number of recommendations for future policy.
- 7.3 The following table summarises the key strengths and weaknesses, opportunities and threats facing the sector:

Table 7.1: SWOT analysis on the manufacturing sector in Northern Ireland

Strengths	Weaknesses
<p>The university system in NI is amongst the strongest in the UK and as a result, NI has a strong skills base. In addition, there is potential to access additional skilled labour as three-quarters of NI's graduates studying outside the Province do not return due to the lack of skilled employment opportunities. Therefore NI has potentially, a considerable untapped skills base.</p>	<p>NI faces an eroding cost base, once a key strength in the region. The survey of manufacturing firms found that 85% reported costs rising ahead of inflation, while only 53% of the companies reported increased profitability over the same period. In particular, the greatest increases occurred in insurance costs, followed by labour costs, energy, transport and land and buildings.</p>
<p>NI has a strong manufacturing tradition with a rich history in linen, general textiles, engineering and ship building.</p>	<p>The structure of NI businesses presents a weakness. Of the 64,815 VAT and PAYE businesses in the economy, 88.4% have less than 10 employees, which may restrict their ability or capacity to innovate, research and develop new ideas, continually train staff, and afford cutting edge technology.</p>
<p>Northern Ireland has the best business survival rate behind the North East when compared to the 12 Government Office Regions in Great Britain.</p>	<p>A high proportion of manufacturing firms (66%) are family owned businesses, which may impact on their decision making process, i.e. they may be less likely to outsource low value added production processes given their ties to the local economy.</p>
<p>Northern Ireland has historically had a relatively good system of industrial development support.</p>	<p>As highlighted in the literature review, NI has been accused of lacking entrepreneurial firms, a key driver of economic growth and champion of high tech, innovative production and products.</p>
<p>NI has a history of successfully attracting FDI when compared to GB. Analysis of FDI indices shows that throughout the 1990s NI consistently outperformed the UK average with the exception of the last two years.</p>	<p>Despite having such a large stock of businesses, the start-up level in NI is one of the poorest when compared in a UK context. Analysis of NI's VAT registrations for 2002 show that the region was ahead of only Wales and the North East. In order to bring the region's level of start-ups up to the UK average, it would require an additional 1390 businesses being created per annum.</p>
<p>NI has a relatively good quality access infrastructure in place which is currently improving due to the growing number of air routes becoming available.</p>	<p>Again, as highlighted in the literature review, local firms may have a dependency on Government support. As a result, this can lead to, or build on the lack of entrepreneurial firms noted above.</p>
	<p>As shown in the analysis of recent trends, NI has a high dependency on traditional manufacturing. For example, regardless of 14,400 jobs lost in the textiles sector from 1993 to 2003, location quotients show that it is nearly double the size when comparing it to the UK average.</p>
	<p>NI also has a low incidence of R&D when considered in a UK context. For example National Statistics state in their publication <i>Productivity in the UK</i>, that NI's R&D expenditure as a proportion of GDP was 0.9% in 1999, compared to 1.1% in Wales, 1.3% in Scotland, 1.4% in London, 2.9% in the South East and 3.2% in East. Furthermore, analysis of expenditure on R&D performed in UK businesses shows that NI is only above Wales. It should be noted that FDI manufacturing companies account for the majority of the R&D spend, with 10 companies accounting for over 60% of NI R&D spending. Overall NI business expenditure on R&D has fallen since 2000 and NI R&D expenditure per capita fell 8 per cent in 2002. It should be noted that the main FDI projects still available to Northern Europe are those focusing on innovation and R&D, such as pharmaceutical and medical devices and complex electronics.</p>

Strengths	Weaknesses
	As touched on in the literature review, NI has been accused of having a relatively poor ability to incorporate new technology into their production processes; perhaps as a result of the high dependence on traditional manufacturing. Consequently, this feeds into the relatively poor record of business start-ups.
Opportunities	Threats
Technology change has created huge opportunities. For example, the internet and e-mail means that local companies can work with and supply goods and services to organisations / customers from different countries. There are therefore opportunities for local firms to link up with and learn from 'market leaders' across the globe.	The pace of globalisation and the increased access to world markets has increased competition in the manufacturing sector. There is a possible threat that low cost bases elsewhere become more accessible and compete for the traditional type of FDI that NI used to target. Given the increases in NI's cost base, the economy can no longer compete on cost with the likes of India, Asia and the Accession economies. Instead local businesses must shift their focus from low-cost production to competing on standards of quality.
Opportunities exist in high value added niche areas regardless of the broad manufacturing sector, which is likely to require the adoption of high technology production processes and products, and as a consequence a highly skilled workforce.	Given the pace of change of technology, if an economy or indeed a firm are not at the forefront of change they will soon find themselves uncompetitive. As a result, firms must be able to manage technological transition, develop technological capabilities, and keep abreast of the latest production techniques. Given that one of NI's weaknesses is its poor ability to harness new technology, this pace of change of technology poses a possible threat.
There is currently a shift in global attitudes towards sustainability and the environment. Since NI products meet EU environmental legislation, they could become more attractive to global consumers. In addition, local firms may also have a head start on regions that are yet to pass environmental legislation.	NI's small manufacturing base limits the ability to establish local networks. For example, according to the Inter Departmental Business Register (IDBR) 2004, there were only 3,845 manufacturing firms in 2003. In addition, 92.6% of manufacturing firms had less than 50 employees. However looking forward, local firms should be forming virtual networks with 'market leaders across the globe.
Evidence from the literature review shows that opportunities exist in relation to the development of networks. In particular, the case of Emilia-Romagna in Italy shows that rapid growth can be experienced based on SMEs in dense networks.	The survey found that local firms believed they were subject to too much bureaucracy. The survey found when asked what specific actions government could take to improve the business climate and to increase competitiveness, over half the 162 manufacturing firms surveyed claimed red tape and bureaucracy as their greatest government-imposed chore.

Opportunities	Threats
	<p>A further threat potentially impacting on NI is the situation with the post-2006 EU Structural Funds. NI has enjoyed Objective 1 in Transition status for the period 2000-2006 and over that period NI will have received some £1.4bn in EU Structural Funds. However, at the end of 2006, existing Assisted Areas and EC approvals to notified State Aid Schemes, such as Selected Financial Assistance (SFA), will cease, although support for SMEs and guidelines and frameworks (R&D, Training) should continue after 1 Jan 2007. However the major problem is that, under the Third Cohesion Report proposals, NI would not qualify for any Assisted Area status, post 2006. In the current economic environment, NI needs both stronger control of state aid and greater flexibility to focus aid where it is needed most. Invest NI and DETI are already in discussion with other UK regional bodies in an attempt to persuade the UK government to aggressively support future Regional Aid guidelines that:</p> <ul style="list-style-type: none"> • permit member states to implement low level, non distorting aid schemes in a proactive manner, responding to market difficulties as they arise; • ensure appropriate horizontal guidelines are in place to target specific market failures effectively; and • apply a more targeted approach to regional investment aid. <p>Should the arguments fail, SFA within NI would disappear or diminish. This will eliminate the incentives which Invest NI currently exploit in its endeavours to attract large mobile investment projects. This will seriously damage NI's ability to attract FDI in a climate of greater competition both within the enlarged EU and globally. The impact will be particularly severe as NI is in direct competition with RoI for mobile FDI. Post 2006, the Borders, Midland and Western regions of RoI will retain their incentives, including the unitary 12.5% corporation tax rate.</p>
	<p>PwC's report <i>The NI Economic review and prospects, 2004</i> found that, there are concerns that the cost of doing business in NI has accelerated faster than other regions. Much of this concern is anecdotal and is based on growing alarm over the process of 'normalisation' in NI. It is worth noting that normalisation has progressively removed, or will remove over time, a number of incentives to business and industry in NI, including, capital allowances, capital grants tax free status, industrial de-rating and rates exemption on vacant commercial property. The manufacturing survey in Section V showed that when asked about what they would do if industrial de-rating were abolished nearly 30% reported that they would explore cost savings, a further quarter reported that they would do nothing, 16% felt they would reconsider investment decisions, while 18% said they would close or reduce the scale of business.</p>
	<p>Again, PwC's report <i>The NI Economic review and prospects, 2004</i> found that, over the past decade there has been a substantial percentage of companies seeking improved access to venture capital (VC) support, as compared to the steady 2-4% that actually uses VC as a growth medium. In 2004, there was no exception with 12% of companies calling on government to offer greater access to VC. Some 17% of indigenous owner-managed companies and of the sub-10 employee category concurred, as did 15% of 50-99 employee companies. Furthermore, PwC's 2002 <i>Economic Review</i> published a detailed examination of VC as a stimulus to growth. By way of summary, 41% of the firms in the 2002 survey group were prepared to use VC to grow their businesses, with 59% opposed, the majority of those opposed, being wary of relinquishing control of their company or simply admitting their ignorance of VC as a growth vehicle.</p>

Policy observations

7.4 We have set out our discussion of the policy implications of this research under three headings:

- a) The future role of manufacturing in the Northern Ireland economy;
- b) How policy can support the development of this role; and
- c) What are the policy options available.

Future role of manufacturing

7.5 The broad objectives of this assignment were to:

- survey current manufacturing sector development including an examination of the contribution to the economy (in terms of employment, research and development / innovation activity, exports, output and gross value added) and productivity levels;
- identify the key global trends in manufacturing, and to review the demand-side and supply-side drivers of those trends;
- identify the corresponding demand-side and supply-side constraints in the Northern Ireland manufacturing sector;
- project forward future trends for manufacturing sector development in Northern Ireland, based on the existing structure of Northern Ireland manufacturing and policy framework and compare to the UK trends; *and*
- assess the future implications for the Northern Ireland economy as a whole in terms of job quality and income levels under the projected scenario.

7.6 As such this research has been focused on the **future** role of manufacturing. However, it is important to recognise the important historic role that manufacturing has played in the development of the local economy, beginning with the ship building and linen industries and continuing with a number of other sectors and important firms. This historical tradition is important because it has shaped our manufacturing base and also shapes our attitudes to the role of industry in our economy.

7.7 Nevertheless, it is equally important to recognise, as the research demonstrates, that this role is changing and will change further. Some of the key features of this new role can be summarised as follows:

- The importance of innovation and design;
- The outsourcing of parts of the manufacturing process;

- The development of products with niche markets and high added value;
- The importance of knowledge-based products and processes;
- The reduced role of inward investment, or FDI, in creating new manufacturing employment;
- The increasing importance of sustainable products and processes; *and*
- Increased output with less employment.

7.8 The quotation at the front of this report which is taken from the Review of the Government's Manufacturing Strategy summarises the situation well:

“We find that the competitiveness agenda facing UK leaders in Government and business reflects the challenges of moving from a location competing on relatively low costs of doing business to a location competing on unique value and innovation”
(Porters and Ketels, DTI, 2004)

7.9 This is particularly difficult in a small regional economy like Northern Ireland, where manufacturing activity is based on a large number of small, often family owned firms, whose choice in terms of relocating production processes is restricted.

7.10 For those who believe that manufacturing is the source of all wealth creation and for those who have not embraced the new role of manufacturing, this can be a difficult message to accept. Businesses and workers engaged in more traditional manufacturing activity serving local markets feel that their economic contribution is under valued. The recent surge in the costs of doing business in Northern Ireland, and the proposals to remove industrial de-rating for manufacturing firms, tend to heighten these fears and anxieties.

7.11 Nevertheless, it is important to recognise that manufacturing industry throughout developed economies is going through a period of rapid change. It is important that this change is managed as efficiently and effectively as possible. The message also needs to be articulated, and understood by all the key stakeholders.

7.12 It is important to stress that this does **not** mean that any business that is making low tech products for local markets, and not producing knowledge-intensive products for an international market, has no future. There must always be, and will always be a role for such businesses. However the core of our manufacturing activity needs to move towards the new role outlined above. Indeed, the successful firms of the future will be characterised by the way they go about their business rather than the sector or market in which they are operating.

7.13 The research has nevertheless, identified a number of key sectors or markets with the potential for future growth:

- Bio-technology products including pharmaceuticals;
- Environmentally sustainable products including recycling activities and those linked to renewable energy; *and*
- Health related products, including food products with a positive health content.

7.14 However the research also found that, looking forward, the sub-sector in which a business is located is less important than the actual business itself. There are always opportunities (regardless of size) for businesses within manufacturing sub-sectors, however it is how the business reacts / operates which will determine success and failure. It was found that the characteristics of the successful manufacturing business include the following:

- A focus on both ends of the value chain – innovation and R&D at one end and sales and marketing at the other end;
- A willingness to explore ways of outsourcing the manufacturing process stages of the business;
- A commitment to invest in research and development into new products and processes; *and*
- An ability to make full use of communications and networking with other businesses.

7.15 Building on the points above, Figure 7.1 was developed to illustrate the direction in which local manufacturing businesses need to move if they are to become or remain successful in the new competitive environment.

Figure 7.1: Profile of the successful future enterprise

7.16 Each of the four spectrums in the Figure above represents a key element of future success. Successful firms will shift their focus from low technology production processes to those based on innovation and incorporating R&D. They will be well connected and IT enabled, offering high value added products in niche markets. In addition, the workforce will be required to be well skilled and educated to operate in the new manufacturing environment and to support innovation in business.

Policy support

7.17 Government policy therefore needs to be supportive of these trends in Northern Ireland. This support needs to be placed within the context of existing strategies:

- Economic Vision for Northern Ireland (DETI);
- UK Government's Manufacturing Strategy (DTI); and
- Invest NI Strategy.

Economic Vision

7.18 The Vision is summarised as follows:

“Northern Ireland as a high value added, highly skilled, innovative and enterprising economy which enables us to compete globally, leading to greater wealth-creation and better employment opportunities for all”

7.19 Four key drivers of this vision are identified:

- Increase investment in R&D and promote innovation/creativity;
- Promote and encourage enterprise;
- Ensure our people have the right skills; *and*
- Ensure we have a modern infrastructure in place.

7.20 All four of the above are relevant to manufacturing strategy. Innovation, R&D and design needs to be embedded in the sector leading to increased expenditure on R&D and better links with university research departments. The Regional Innovation Strategy supports this driver. Enterprise is equally fundamental, through support for new start-ups, clustering of existing firms and a focus on opportunities to trade outside Northern Ireland. Appropriate and relevant skills are also fundamental to the future development of manufacturing industry and DEL's Skills Strategy³ is designed to address this need. Finally, having an adequate infrastructure in place is paramount to any leading manufacturing region.

UK Manufacturing Strategy

7.21 The UK Government's Manufacturing Strategy was launched in 2002 and reviewed earlier this year. The Strategy is designed "to help build a successful, knowledge-intensive, highly skilled manufacturing sector" and is based on seven pillars:

- Macroeconomic stability;
- Investment;
- Science and Innovation;
- Best Practice;
- Skills & Education;
- Modern Infrastructure; and
- The Right Market Framework.

³ DEL is currently "consulting on a draft Skills Strategy for Northern Ireland which will ensure that the investment in learning and vocational training is consistent with the needs of the NI labour market. It is about changing the existing provision to ensure that the knowledge based economy is delivered. The change is consistent with a broad policy drive to increase the value of jobs in Northern Ireland and to sustain recent economic performance"

(<http://www.delni.gov.uk/consultdebate/index.cfm/page/details/key/80>)

7.22 The Strategy Review (2004) identified a number of priority areas and an associated Action Plan for the next two years. The Review also contains a summary of what policies are in place to support the manufacturing sector under the Strategy pillars. There is a need to examine the proposed Action Plan to see what more needs to be done in Northern Ireland to support the overall strategy.

Invest NI

7.23 Invest NI's corporate objectives are also relevant to manufacturing industry and echo the Economic Vision. In summary these are:

- To promote innovation in all its aspects, stimulate higher levels of R&D, design and improve knowledge transfer;
- To achieve higher levels of growth by indigenous and externally owned businesses;
- To promote a more enterprising culture in Northern Ireland so as to raise overall level and quality of business starts; and
- To attract high quality, knowledge-based investment from outside Northern Ireland.

7.24 Initiatives are based around these four objectives and encompass manufacturing industry along with other tradeable sectors of the economy. Invest NI is also organised in a way which encompasses manufacturing sectors within other groupings, reinforcing the importance of the firm as opposed to the individual sector. The key sector divisions are described as follows:

- **Clients and Business International Group**
 - a **Transport, Tourism & Construction** - which includes aerospace and transport related manufacturing;
 - b **Engineering and Business Services** – which includes all aspects of engineering industries; *and*
 - c **International ICT** – which includes manufacturing elements of ICT.
- **Clients and Entrepreneurship Group**
 - a **Creative and design-based industries** – which includes textiles, clothing and furniture; *and*
 - b **Biotechnology and food** – which includes food processing pharmaceuticals and chemicals.

- 7.25 The full range of Invest NI support programmes is also available to manufacturing clients, including the various research and technology programmes, marketing support and the local office network.
- 7.26 Invest NI has also been involved in a number of specific sectoral initiatives, a number of which relate directly to manufacturing sectors. For example, the recent *Fit for Market Report*, sets out a strategy for the development of the food processing sector. The organisation is also highly supportive of the development of sectoral networks where these exist within manufacturing industry in Northern Ireland.

Policy Options

- 7.27 In the light of all these strategies and activities, is there anything more that needs to be done to support the evolution and change that the research suggests is needed in our manufacturing base?
- 7.28 In broad terms, we consider that there are three options:
- **Status Quo** – as we have documented above and as the Review of UK Manufacturing Strategy highlights, there is already a great deal of activity going on in support of manufacturing industry in Northern Ireland. However, given the challenges facing the industry that this report has highlighted, in our view a more focussed approach is required.
 - **A new Manufacturing Strategy** – one way of addressing this is to develop a new strategy for Northern Ireland, based on the UK Strategy and the Economic Vision and encompassing the existing activity in Invest NI. This would help to highlight the importance and nature of the changes required and would help demonstrate commitment to support this change. However with government already committed to support on a sectoral and cluster basis, a new strategy may add an unnecessary level of bureaucracy.
 - **Manufacturing Competitiveness Actions** – in our view there are a number of actions which could be taken to strengthen and supplement what is already being done under the banner of “*improving manufacturing competitiveness*”. This will also help to fill any gaps identified in the existing support infrastructure.
- 7.29 In the table below we have summarised the main advantages and disadvantages of these policy options.

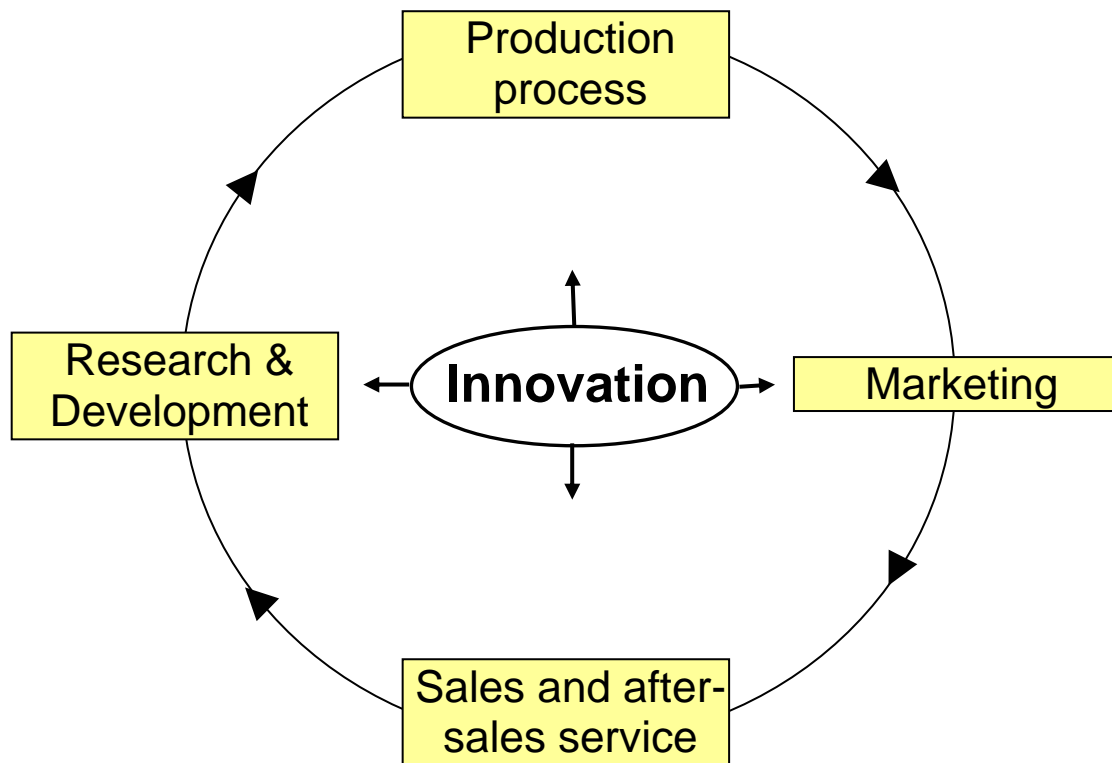
Table 7.2 Assessment of Policy Options

Option	Advantages	Disadvantages
Status Quo/Do Nothing	<ul style="list-style-type: none"> • No additional public expenditure cost • Easy to implement 	<ul style="list-style-type: none"> • Does not address all the problems of adjustment • Unfocused on the sectors needs
New Manufacturing Strategy	<ul style="list-style-type: none"> • Opportunity to co-ordinate and develop activity • Demonstrates government commitment • Moves the changing role of the sector up the political and economic agenda 	<ul style="list-style-type: none"> • Potentially expensive • Raises expectations • Requires high degree of public/private sector co-operation
Manufacturing Competitiveness Actions	<ul style="list-style-type: none"> • Based on Economic Vision • Limited additional public expenditure cost • Demonstrates commitment • Collaborative approach with private sector 	<ul style="list-style-type: none"> • Continuation of declining employment • Communication will be challenging

7.30 On the basis of this assessment we consider that the third option, the ‘Manufacturing Competitiveness Actions’ is the appropriate way forward. In our view this group of actions needs to be carried out through close public / private sector collaboration and with a strong emphasis on communication of the way forward for small and medium sized manufacturing businesses. The main message for this communication is that there **is** a future for manufacturing industry in Northern Ireland, albeit different than before, and that it involves the encouragement of firms to move along the four spectrums set out in Figure 7.1 above.

7.31 Government may also wish to link these ‘Actions’ into its Regional Innovation Strategy for Northern Ireland by placing innovation at the heart of the manufacturing value chain as illustrated in Figure 7.2 below. This illustrates the need for innovation to impact on all stages of the value chain and not just the R&D and design phase. Firms need to be equally innovative in respect of production processes, marketing of products and sales and after-care service.

Figure 7.2: Improving manufacturing competitiveness: virtuous cycle of manufacturing value chain



Action recommendations

7.32 Based on the above strategic policy option of Manufacturing Competitiveness Actions, we have set out a number of suggestions. This is not designed to be a new strategy but rather to build on what is already being done and to work in collaboration with representatives of the manufacturing sector and other Government Departments such as DEL in doing so.

7.33 We have therefore set out our recommendations under the seven pillars of the UK Manufacturing Strategy, which is already in place and provides a framework for these actions. This provides a direct link with the overarching UK strategy and facilitates comparison with the activities of other regions under each of these pillars. Some of the proposed actions straddle more than one pillar so we have placed these under the main pillar to which it refers.

Pillar 1 – Macroeconomic Stability

7.34 This pillar allows businesses to plan for the long term and is outside the direct control of Northern Ireland government. However, it is important to recognise that a number of these macroeconomic issues impact directly on the prospects for local manufacturing industry. These include the following:

- Interest rate decisions by the Bank of England Monetary Policy Committee;

- Budgetary decisions on public expenditure and tax rates affecting industry;
- Future decisions on regional development expenditure and industrial support policy; and
- Exchange rate movements which, while outside direct Government control, impact directly on manufacturing exporters and the costs of business.

7.35 It is important also to recognise that a stable political environment is important to the development of business. In particular it affects the attractiveness of Northern Ireland to new inward investors. While this is also outside the control of the Department, it is important to place any policy recommendation in this context and to acknowledge the effect that it may have on outcomes.

7.36 We have not made any specific recommendations under this pillar but we have picked up these issues under overarching recommendations in respect of how they are debated and considered.

Pillar 2 – Investment

7.37 While the ending of our current status as an Objective 1 in Transition Region after 2006 will place a limit on what can be done directly to support firms through selective financial assistance, it will still be important for government and industry to work together to encourage appropriate and relevant investment in new technology. Traditionally Invest NI, like other regional development agencies, has adopted a sectoral approach, pursuing and encouraging investment in identified key growth sectors.

7.38 One of the key messages from this research is that the future role of manufacturing in Northern Ireland should focus on establishing dynamic firms within each sector that are adapted to the new role as described earlier and have the potential to succeed, whatever sector they are in.

7.39 This requires a twin-track approach by industry and Government:

- Encouraging and attracting dynamic firms in new high value added sectors of manufacturing; and
- Working with existing small and medium sized firms in more traditional sectors of manufacturing to help them adapt to changing circumstances and to become more competitive.

- 7.40 Invest NI in collaboration with sectoral representative bodies has already developed strategies for both traditional sectors, such as clothing and textiles and more recently food processing, as well as some of the newer or developing sectors, such as biotechnology and aerospace. This research has not identified any particularly new or dynamic sectors outside those which are already being targeted. Rather it is the nature and number of individual dynamic firms within any of these sectors which will determine the future success of manufacturing in Northern Ireland.
- 7.41 We have made two recommendations in relation to promotion of investment in manufacturing to reflect the twin-track approach:

We recommend that Invest NI in collaboration with sectoral representative bodies should continue to pursue their various sectoral strategies and within these should focus specifically on encouraging investment in firms, products, processes and initiatives which enhance competitiveness in global markets.

We recommend that Invest NI should continue to meet with the relevant industry representative bodies to discuss cost-effective ways of facilitating the process of change in small traditional, family owned manufacturing businesses. This need to change in response to the new more competitive environment may involve mentoring, training and encouragement of acquisition.

- 7.42 We are also aware of the possible changes in selective financial assistance post 2006 and the challenges that this will present. This also places an imperative on local business as well as those responsible for encouraging economic development to take action.

We recommend that there should be a full economic impact assessment of the effects of the changes in selective financial assistance in NI in the light of:

- **The outcome of post 2006 negotiations on state aids;**
- **The need to encourage investment in high value added products and processes;**
- **The long lead times for the development of businesses in the new growth sectors; and**
- **The potentially high cost per job of new jobs created in manufacturing.**

- 7.43 Facilitating this change to a more competitive and dynamic manufacturing sector also requires individual firms to understand and adapt to the changing competitive environment.

We recommend that local manufacturing firms consult with their sectoral body or Invest NI and develop a clear business strategy for investing in products and processes which enhance competitiveness in global markets.

Pillar 3: Science & Innovation

- 7.44 Invest NI is already very active in supporting all businesses to exploit the existing scientific base in Northern Ireland to create innovative high value products and processes. ‘Think-Create-Innovate’, the Regional Innovation Strategy, coordinates the various programmes that are available in this area.

We recommend that within the existing Regional Innovation Strategy for Northern Ireland there should be a renewed focus on innovation at all stages of the business process, to highlight the requirement of moving from low value added activities to high value added innovative activities and products.

Pillar 4: Best Practice

- 7.45 This pillar relates to the need to raise productivity and competitiveness by continuous improvement. Organisations with assistance from Invest NI provide support for technology transfer in smaller companies and Invest NI’s Technology Advisory Service helps small businesses focus on innovation and provide links with local universities and FE colleges. However, there may be other ways to assist firms to explore what these changes will mean for them, through other industry bodies.

We recommend that consideration should be given to establishing an initiative to allow local manufacturing businesses not only to explore best practice in technology and innovation in their sector as tends to happen at present, but also across other sectors, between suppliers and customers and between business and the science / innovation base.

- 7.46 Outsourcing of parts of the manufacturing process represents both an opportunity and a threat to Northern Ireland business. In our view the opportunity should be actively encouraged in relation to transferring out the lower added value elements of the process to more competitive locations, leaving the firm to concentrate on the higher value added and service-sensitive elements of the business in Northern Ireland.

We recommend that consideration should be given by the manufacturing sectoral bodies to raising the awareness of the opportunities that outsourcing provides to improve the competitiveness of local industry.

- 7.47 The development of networks, either physical or virtual, is an important element of any strategy for manufacturing industry going forward. Invest NI and the various sectoral representative bodies have made considerable progress in this area which is not easy given the relatively small scale of our manufacturing base. In our view this process needs to be encouraged and supported with the active participation of the sector bodies.

We recommend that manufacturing sectoral bodies should be encouraged to develop proposals for enhancing and strengthening “outward and forward looking” networking activities between firms both within and outside Northern Ireland, including the concept of combined manufacturing / service sector networks.

- 7.48 For Northern Ireland’s manufacturing sector to succeed in this new environment, they must be innovative in all parts of the manufacturing value chain, as illustrated in Figure 1.2 above. This may require a degree of re-education for local manufacturing firms and the embedding of an innovative approach to business development.

We recommend that all firms should seek to benchmark their business against best practice in all aspects of the business process.

Pillar 5: Skills and Education

- 7.49 This area of activity is about developing a skilled and innovative manufacturing workforce. Although it was not strictly within our terms of reference, its importance to the future development of manufacturing industry is such that it needs to form part of any forward strategy.

We recommend that DETI should provide on-going input to the outworking of the DEL Skills Strategy in relation to the implications of the changes in the role of manufacturing for the skills and education of the workforce. It should also highlight the need to strengthen skills in complementary service sectors such as sales, marketing, business, finance and management skills.

Pillar 6: Modern transport infrastructure

- 7.50 The envisaged changes in the role of manufacturing industry also have implications for the regional transport infrastructure. The Regional Strategic Transport Network Plan is currently under consultation as is the Investment Strategy for Northern Ireland. It is important that these plans reflect the future needs of the manufacturing industry which will require good ports and airports provision as well as roads transport infrastructure. Northern Ireland is suffering from an underinvestment in modern infrastructure which needs to be addressed.

- 7.51 The Investment Strategy for Northern Ireland has the objective of addressing the infrastructure gap. Over £2bn is earmarked for transport related investment over the 10 year period of 2005 to 2015. The Regional Transport Strategy for Northern Ireland is already giving rise to considerable investment. However, in the later years of ISNI, additional investment will be made in roads and this will result in higher standards of carriageways providing improved access for private and commercial traffic to all major cities.

We recommend that the needs of manufacturing industry should be clearly reflected in the latest transport investment plans and that DETI should take an active role in collaboration with the Strategic Investment Board in promoting investment in airports and ports and in roads provision.

Pillar 7: The Right Market Framework

- 7.52 Much of the regulatory environment for manufacturing industry is determined by legislation emanating from Brussels and London and this limits what can be done at local level. However, local business organisations should continue to press government for changes that will improve the competitiveness of manufacturing industry here.

Overarching recommendations

- 7.53 Finally, in our view there is a need to increase the awareness and understanding of issues relevant to the future of manufacturing in Northern Ireland, particularly among the small and medium sized enterprises that account for a large proportion of existing employment in the sector. A joined up approach is required between Government and Industry and also involving the UK Manufacturing Forum which has been set up to support the implementation of the Manufacturing Strategy throughout the UK.
- 7.54 In our view there is a need for a common understanding of the future role of manufacturing in Northern Ireland, which presents the positive view of the role of the sector instead of the current very negative view of a sector in decline and with no future. This more positive attitude then needs to be shared widely throughout the business and education sectors. This might take the form of a communications campaign which would require some further consideration.

We recommend that Government should develop a programme of action for a communication plan, to promote the key message that manufacturing has a future, but it will be those companies that are willing to change and adapt to the new realities that will survive. As an initial step, the Joint Industry Chair of the UK Manufacturing Forum should be invited to visit Northern Ireland to make presentations to the key representative bodies on the future role of manufacturing in the UK.

7.55 We also consider that there is a need for an on-going discussion with representatives of manufacturing industry on these matters. There are already a number of existing fora in which the sector engages with government.

We recommend that DETI and Invest NI meet with interest groups to discuss the findings of this report and ways to progress the recommendations. This should lead to the development of short focused action plan which might be based on the recommendations arising from this report.

7.56 Table 7.3 below takes each of the recommendations above and prioritises them based on their importance into high, medium and low categories:

- ‘High’ means that the recommendation is of top priority;
- ‘Low’ means that the recommendation is still important but of relatively low priority because it represents a continuation of existing activity; and
- ‘Medium’ means that the recommendations is important but is of less immediate priority than high priority.

7.57 In addition, Table 7.3 shows how each of the recommendations reflect the four underlying drivers of DETI’s Economic Vision, and whether the onus for achieving each recommendation is on the public sector, private sector or both.

7.58 It is clear from the table that the majority of recommendations are either of high or medium priority. Overall however, implementing these recommendations will help achieve the four economic drivers of the Economic Vision.

Table 7.3 Prioritising the recommendations and reflecting their linkages with the Economic Vision

Recommendation	Relative importance	Drivers of the Economic Vision	Public / private onus
Pillar 2 - Investment			
We recommend that Invest NI in collaboration with sectoral representative bodies should continue to pursue their various sectoral strategies and within these should focus specifically on encouraging investment in firms, products, processes and initiatives which enhance competitiveness in global markets.	Low	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Public
We recommend that Invest NI should continue to meet with the relevant industry representative bodies to discuss cost-effective ways of facilitating the process of change in small traditional, family owned manufacturing businesses. This need to change in response to the new more competitive environment may involve mentoring, training and encouragement of acquisition.	Low	Ensure our people have the right skills for future employment opportunities	Public and private
<p>We recommend that there should be a full economic impact assessment of the effects of the changes in selective financial assistance in NI in the light of:</p> <ul style="list-style-type: none"> • The outcome of post 2006 negotiations on state aids; • The need to encourage investment in high value added products and processes; • The long lead times for the development of businesses in the new growth sectors; and • The potentially high cost per job of new jobs created in 	High	Promote and encourage enterprise	Public

manufacturing.			
We recommend that local manufacturing firms consult with their sectoral body or Invest NI and develop a clear business strategy for investing in products and processes which enhance competitiveness in global markets.	High	Promote and encourage enterprise	Private
Pillar 3 – Science & innovation			
We recommend that within the existing Regional Innovation Strategy for Northern Ireland there should be a renewed focus on innovation at all stages of the business process, to highlight the requirement of moving from low value added activities to high value added innovative activities and products.	High	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Public
Pillar 4 – Best practice			
We recommend that consideration should be given to establishing an initiative to allow local manufacturing businesses not only to explore best practice in technology and innovation in their sector as tends to happen at present, but also across other sectors, between suppliers and customers and between business and the science / innovation base.	High	Increase investment in R&D and promote innovation / creativity Ensure our people have the right skills for future employment opportunities Promote and encourage enterprise	Public and private
We recommend that consideration should be given by the manufacturing sectoral bodies to raising the awareness of the opportunities that outsourcing provides to improve the competitiveness of local industry.	Medium	Increase investment in R&D and promote innovation / creativity Ensure our people have the right skills for future	Private

		employment opportunities Promote and encourage enterprise	
We recommend that manufacturing sectoral bodies should be encouraged to develop proposals for enhancing and strengthening “outward and forward looking” networking activities between firms both within and outside Northern Ireland, including the concept of combined manufacturing / service sector networks.	Medium	Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise	Private
We recommend that all firms should seek to benchmark their business against best practice in all aspects of the business process.	Medium	Promote and encourage enterprise	Private
Pillar 5 – Skills & education			
We recommend that DETI should provide on-going input to the outworking of the DEL Skills Strategy in relation to the implications of the changes in the role of manufacturing for the skills and education of the workforce. It should also highlight the need to strengthen skills in complementary service sectors such as sales, marketing, business, finance and management skills.	Low	Ensure our people have the right skills for future employment opportunities	Public and private
Pillar 6 – Modern transport infrastructure			
We recommend that the needs of manufacturing industry should be clearly reflected in the latest transport investment plans and that DETI should take an active role in collaboration with the Strategic Investment Board in promoting investment in airports and ports and in roads provision.	Medium	Ensure a modern infrastructure in place to support business & consumers	Public

Overarching			
<p>We recommend that Government should develop a programme of action for a communication plan, to promote the key message that manufacturing has a future, but it will be those companies that are willing to change and adapt to the new realities that will survive. As an initial step, the Joint Industry Chair of the UK Manufacturing Forum should be invited to visit Northern Ireland to make presentations to the key representative bodies on the future role of manufacturing in the UK.</p>	<p>High</p>	<p>Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise</p>	<p>Public</p>
<p>We recommend that DETI and Invest NI meet with interest groups to discuss the findings of this report and ways to progress the recommendations. This should lead to the development of short focused action plan which might be based on the recommendations arising from this report.</p>	<p>High</p>	<p>Increase investment in R&D and promote innovation / creativity Promote and encourage enterprise Ensure our people have the right skills for future employment opportunities Ensure a modern infrastructure in place to support business & consumers</p>	<p>Public and private</p>