NORTHERN IRELAND'S MANUFACTURING THE ENGINE OF PROSPERITY

AN ECONOMIC ANALYSIS AND CALL TO ACTION

MANUFACTURING
NORTHERN IRELAND

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Foreword

Why Carson McDowell supports local manufacturing

By Richard Gray, Partner, Joint Head of Corporate at Carson McDowell

Carson McDowell Solicitors is proud to sponsor Manufacturing and the Northern Ireland economy.

This is a significant piece of research by Manufacturing NI which will hopefully be used to inform policy on manufacturing at the highest level of government and which will enable the industry to secure the support needed to succeed in the future.

Northern Ireland has a proud manufacturing tradition and you only need to read the headline numbers from this in-depth report to be reminded just how important the manufacturing sector is to our economy. It directly contributes more than 85,000 jobs – some 10 per cent of our employment – and 14 per cent of total economic output in the region. What's more, jobs in manufacturing are often highly skilled, well paid and responsible for cutting edge research and development.

As Northern Ireland's largest independent law firm, Carson McDowell has been advising local manufacturers for many years. We represent some of the industry's most successful companies, from large, multi-site exporters employing more than a thousand people, to smaller, niche firms who have made a name for themselves with innovative products and market leading technology.

Our clients in all parts of Northern Ireland are helping to drive a sector that contributes two thirds of the region's export sales and substantially more to the economy through its supply chain and wages.

We know these are tough times for some companies in the manufacturing space, with both internal and external headwinds putting businesses under pressure. Whether it is from global economic uncertainty, unfavourable exchange rates, high local energy costs or cheap competition from overseas, we can't deny there are some dark clouds on the horizon.
But we share Manufacturing NI's optimism that, if the challenges from competition and rising costs can be overcome, then manufacturing in Northern Ireland can grow faster than the other regions of the UK over the next decade.

It is to be hoped that the Investment and Economic strategies in the next Programme of Government from the Northern Ireland Executive will give manufacturing it's place and that the new Department of the Economy will set more ambitious targets in its strategy for the sector. The extent to which policymakers engage with our manufacturers and seek to help them realise their goals will determine how much more the sector contributes to future economic growth and to the rebalancing of the economy here.

What is clear from the report is that we should not be lamenting the decline of manufacturing in this part of the world. Instead we must celebrate success and do all we can to support the sector, to foster the conditions that allow our companies to thrive and to ensure that the Made in Northern Ireland stamp continues to be an internationally recognised symbol of quality.

Manufacturing NI is to be congratulated on this valuable piece of work, which confirms that in 2016 manufacturing is still very much the lifeblood of the Northern Ireland economy.

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SCORPION

NI Manufacturing: The Engine of Prosperity

We are pleased to present this report on the contribution which manufacturing makes to the Northern Ireland economy. For what is believed to be the first time, the report from Oxford Economics uncovers the full impact on jobs, wages, GVA, exports and other areas on both a macro NI level and in each of our 11 new Councils. We hope the NI Executive and its Departments and agencies as well as local Councils find this analysis useful when settling on their actions and interventions which will grow the economy and build strong communities. The NI Executive has a number of significant challenges – creating wealth and work across NI; sustainable, well paid highly skilled and entry level jobs; closing the productivity gap with GB and the EU; building strong, healthy communities; increasing exports; developing an innovative, modern economy and rebalancing an economy.

It is clear from this Oxford Economics report that no other part of our economy delivers these outcomes more than the manufacturing sector...

- 214k direct and supported jobs – 1 in 4 of all jobs in the economy.
- A £9.9bn GVA, around 1/3rd of the economy.
- Productivity at £55,700 is 38% higher than NI average with advanced manufacturing contribution 27% more.
- Exports at £6bn, almost two-thirds of all export sales.
- £254 million in R&D in 2014, accounting for over 60 percent of total business investment.
- Attracting £900 million in FDI Between 2010 and 2014.

An impressive list! However, we risk missing out on an enormous opportunity to transform our economy and with it the fortunes of communities across NI.

Europe wants to reindustrialise. The target is 20% of GDP. Our local manufacturing sector currently contributes 14%, which is ahead of the UK at 10%, yet in the Republic of Ireland, it contributes some 23%. Just think for a moment what reaching that EU target would mean GVA, exports and jobs right across NI. Setting a course, commiting to a plan to reach that target would deliver the outcomes so cherished by the Assembly and by local Councils. Others have found a way to reindustrialise, we should learn from this and adapt to optimise for our circumstances.

So, how do we get there? For us, it is about **creating the most competitive region in Europe in which to start, sustain and grow a manufacturing businesses thus creating wealth and work.**

To achieve this, there are a number of policy actions which the NI Executive, its agencies, partners and local Councils need to establish. And, the good news is most of these do not require any additional financial support:

Ambition

We are calling on the new Programme for Government, Economy Department and local Council's economic plans to have more ambition, set stretching targets and take assertive action to deliver an economy which will be the envy of Europe. 1% of our manufacturers employ 50% of the people and account for 50% of turnover. We need to positively support our SME's to quickly become world leaders and grow their impact on the economy.

A Manufacturing Strategy

A cross cutting, whole government plan to achieve the EU's 20% target. For instance, how Council's, NI Executive Departments and its agencies procure to ensure much more local content is as important as what enterprise support, skills investments and energy policies the Economy Department will make. Education is more than just the curriculum. It is schools through Universities and Colleges, apprenticeships and indeed research. An across government approach would lead to better outcomes for children, families and the economy.

A Target on Competitive Energy Prices

As evidenced in the success of renewable generation targets, setting a price will drive market and regulatory action to deliver the prices which mean NI exporters can compete.

Stability on Rates policy

A long term commitment to industrial derating and a focus on driving down the rate poundage will release investment currently stalled by uncertainty.

A labour market regime fit for our new economy

Prioritising the right skills development from schools through to third level education, improving the attractiveness of apprenticeships and investing in leadership should be supported alongside a review of employment legislation which would unlock full-time, permanent employment and companies willing to invest more in upskilling the workforce.

Cherish and Celebrate

Our products are enjoyed in markets at home and abroad. What we have, we must hold and grow by placing manufacturing at the heart of economic and regeneration plans. More should be done to take these great products, made by great people in great businesses to the centre of decision making in Belfast, London, Dublin, Brussels, Washington and locations across the globe where the NI Government has a presence.

The coming years will see jobs in our public sector shrink. Work creates wealth and as a result, a healthy community. NI's manufacturers are committing to create these jobs. For this potential to be fulfilled, we must address the competitiveness areas which hinder its success.

What we are calling for are largely straightforward, some requiring little or no funding, but does need a strong commitment by both industry and Government to act. A failure to do so will kill the engine of prosperity.

Northern Ireland manufacturers were at the heart of the 19th century industrial revolution. They are poised and willing to go again. Let us collectively commit to reach the EU's 20% target, reindustrialise Northern Ireland and once again have a productive, internationally envied and quickly growing economy based on well paid, highly skilled and regionally dispersed jobs.

We will deliver:

- More wealth and work across Northern Ireland
- Modernised production facilities
- Greater contribution to GDP
- Sub-regional development
- Quality, well paid, sustainable employment
- A highly skilled, productive workforce
- Increased capital Investment
- Reduced carbonised emissions

But we need:

- A cross cutting Manufacturing Strategy and a cost competitive environment
- A long term commitment on de-rating
- Competitive energy prices
- Improved infrastructure
- Facilitative employment law
- Investment at all levels, including leadership
- More agile enterprise support
- Efficient utilities and an electricity market that works for customers


BARGSTEDT

Specific Actions

Rates

Rates are a tax on space. Manufacturing by necessity requires more space than all other business groups, much of which cannot be commercialised. The result is manufacturing businesses pay the 2nd largest bill per business compared to other sectors.

The rates cap for manufacturing must remain beyond the current 2016-17 commitment. This lack of certainty is holding back investment.

As a pre-EU accession relief, the cap on industrial rates is one positive competitive point of difference that can be used to promote Northern Ireland as a place for foreign direct investment and to encourage indigenous businesses to invest and expand operations.

If the cap on rates is lost, it is gone for good, resulting in irrevocable damage to our manufacturing base.

Actions:

1. Industrial de-rating needs to be secured for the long term, bringing certainty and releasing investment from internal or external funders.
2. The 'rate in the pound' should not exceed current levels.
3. The promised economies of scale from RPA must be reflected in reducing rates bills.
4. Councils should use the power available under current legislation as a tool for economic development.

Energy – Electricity

Energy is usually the third largest input cost for business after labour and materials costs. All categories of non-domestic consumers bar the very small customers suffer the 2nd most expensive electricity in Europe. Small/Medium customer +44%, Medium customers +41% and Large/Very Large customers +58% compared to the EU average. Manufacturers represent less than 1% of all customers but pick up more than 20% of the energy bill.

Many manufacturers have resorted to self-generation – investing their own money which would be better spent on investing in markets, machinery and employment – in order to try to achieve competitiveness. However, as they go 'off-grid', this adds cost to all other consumers.

There are issues which need immediately addressed – the allocation of network charges; how the market operates leading to excessive profits for generators; the cost of connections; and, 'add-on' costs from NI government policy. We are fast approaching having the unenviable

reputation for having the most expensive energy in Europe which would make it virtually impossible to attract new investment. The fundamental problem remains the lack of a policy target on price and affordability to impact where we sit in terms of competitiveness within the EU. We need a commitment, a target to move us from the 2nd most expensive market in Europe.

Electricity prices, competitive in Europe, must be a NI Executive strategic priority.

- ***Reduce*** *Generation, grid and market operator costs*
- ***Avoid*** *Unnecessary policy and incentive costs*
- ***Allocate*** *Cost equitably between customers*
- ***Support*** *Demand reductions for large customers*

Actions:

1. There must be a Programme for Government target, supported by the refreshed Strategic Energy Framework, to set a policy target for prices competitive with the EU average.
2. Regulators must address generator profits which see some earning gross margins of 69% and net margins of up to 37%.
3. The redesign of the wholesale market and additional ancillary services must guarantee better outcomes for consumer prices including removing or penalising ESB's market power to improve liquidity.
4. There must be better performance from SONI and its partners in delivering an efficient market including reducing the €515m capacity payment and €171m constraint costs.
5. Clear blockages which are prohibiting customers from being active in the market.
6. A reinstatement of direct subsidies for business to reduce energy demand and cost. The development of on-site generation at locations which need the power in the first instance.
7. With a budget in excess of £8m per annum, the Utility Regulator must put a greater emphasis on non-domestic prices. There should be customer representation on their Board.
8. The Regulator and the Economy Department must ensure NI businesses are not adversely affected by how costs are distributed between customer groups.
9. No security of supply or new generation projects should be committed where there is a possibility to add significantly to customer bills.
10. NIEN's planning standards should be contemporary with transparency provided to customers on the standards which they use in their decision making.
11. A change in the NIEN licence is required so as more companies become energy independent, remaining customers are not be adversely effected.
12. The Executive should maximise the benefit to NI companies from renewables by becoming a centre for excellence in the manufacturing, installation and servicing of renewable technologies both for home and export markets.

Energy - Gas

Final delivered gas prices in NI are the 2nd most expensive in Europe. Its delivery through transmission and distribution networks should be as cost effective as possible in order to encourage its more widespread use. There should be greater availability for supply at manufacturing clusters and the support models for making connections enjoyed by customers on existing networks should be applied to new pipelines.

Actions:

1. Gas network extensions need to be delivered in the most cost efficient way for all customers.
2. The cost of any new network should be equitably shared across customers groups – business should not be propping up the domestic consumer.
3. Existing Gas customers in Belfast and the "10 Towns" should be assured that there is no adjustment to the gas licence which adds undue costs to their bills.
4. Any amendment to price controls or tariffs which impacts on customer bills requires extensive consultation with large users as this impacts on short-term performance and long-term investment plans.
5. Secure competitive price for CHP gas by retaining discounts.

Water

Business is the only consumer group which pays twice for our water system – benefitting all customers. Our water operator is improving but remians inefficient: 30% less than benchmarked comparators.

Actions:

1. The Regulator and NI Water must resolve the continuing problems with incorrect billing.
2. Price should be based on total consumption and not on the number of metered inputs.
3. Network investments should be done in the least disruptive and cost effective way.
4. Future Utility Regulator Price Controls on NI Water should continue to drive efficiency and narrow the 30% gap with benchmarked comparators.

Labour – Skills

Our economy and our businesses depend on a skilled workforce – both in existing employees and new arrivals. We need excellent schools and informed careers advice preparing all pupils for the workplace and sustainably funded skills development through quality apprenticeships and third level education.

Actions:

1. There should be greater support for quality manufacturing leadership, management, specialist professional training and apprenticeships.
2. Schools, Colleges and Government should work more closely with employers to have a greater understanding and delivery of high-quality careers advice for roles within manufacturing.
3. An expert panel of employers who should advise on training needs right throughout manufacturing sector.
4. The profile of apprenticeships should be enhanced to make it a career path of choice.
5. Funding, including Apprenticeship Levy income, should move to employers as opposed to being solely controlled by the colleges. The concept of the training school with experienced instructors needs to return.
6. All parties should prioritise the encouragement of engineering and STEM-related apprenticeships.
7. There should be a concerted effort to increase the number of women in manufacturing and engineering.
8. The opportunities for 3rd level study in STEM subjects should be provided across Northern Ireland by providing appropriate investment in Colleges and Universities close to where manufacturers are based.

Labour – Employment Law

Inconsistency in employment law is barrier to job creation, inward investment, operating efficiency and a competitive disadvantage for NI companies competing for work in GB. We support the basis for a living wage and seek the support of workforce representatives and others to improve productivity in return. A fair day's pay for a fair day's work benefits all parties.

Actions:

1. Workforce representation is supported. We encourage greater dialogue between all parties.
2. Agencies are an important source of capacity. However, this requires regulation ensuring that rates are properly reflected in what the people doing the work take home.
3. Employment law reform is needed to include mandatory early conciliation for workplace disputes.
4. Allow employers and employees to have "protected conversations".
5. Extend the qualifying period for unfair dismissal from 1 year to 2 years, in line with GB. The 1 year qualifying period acts as a deterrent for small businesses to take on new employees resulting in zero-hours, temporary and rolling contracts rather than full-time permanent positions being created.
6. More information on actual tribunal compensation settlement awards to be made available to tribunal chairs to lead to more consistency in the level of awards made.

Finance and taxation

New projects and investments are often very capital intensive and planned to decades-long time scales. For start-ups and small businesses, it can be particularly difficult to identify and secure available support.

Actions:

1. Other EU regions find creative ways to invest in supporting manufacturers including significant capital support – we would encourage Invest NI and others to benchmark their support packages to the best and most agile in Europe to grow indigenous manufacturing businesses.
2. The NI Corporation Tax powers can be 'supercharged' by lobbying Westminster for changes to capital investment allowances to cover the whole of NI.
3. There should be simplified and streamlined processes of applying for government support schemes by focusing on the needs and experience of the client from initial engagement to delivery.

Infrastructure

Every part of the economy requires modern, effective infrastructure to be successful. This is particularly important to manufacturers to get goods to market and evidenced by their close proximity to transport corridors. Whilst there have been improvements, there remains important strategic projects outstanding which hinder growth and sub-regional regeneration.

Infrastructural developments are internationally proven to provide enormous economic benefit in the short and long term. Focus and funding must be found to escalate their delivery.

Actions:

1. A commitment to a fully funded, time bound completion of the A6 dual carriageway.
2. A speedy resolution to the A5 Planning Appeal and a commitment on a timescale for full delivery.
3. Plans to extend the A4 to Enniskillen and working up plans for the upgrade of the A29 and A26.
4. A more supportive regime within Transport NI which works with companies to get their product to and from ports efficiently.
5. The efficient and expedient delivery of gas and electricity infrastructural project in both transmission and distribution including the 2nd North South electricity interconnector.
6. An investigation into the costs of ferry travel to GB which is sometimes x5 more expensive than across the English Channel.

7. The development of high-speed broadband particularly to manufacturing clusters.
8. A single, central and accountable regime which speeds up the delivery of infrastructural and capital projects on behalf of all NI Executive Departments and the inclusion of more local content in its delivery.

OXFORD ECONOMICS

MANUFACTURING AND THE NORTHERN IRELAND ECONOMY

A REPORT FOR MANUFACTURING NI

MARCH 2016

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MANUFACTURING
NORTHERN IRELAND

Executive Summary

A strong manufacturing sector is vital for Northern Ireland's economy.
The sector has undergone significant challenges over the last 30 years owing to deindustrialisation and increased international competition. Nonetheless, manufacturing has a decisive role in the performance of the economy. It provides highly skilled and well paid jobs, drives innovation, R&D and productivity, as well as providing external balance to the economy. Undoubtedly, and as this report explores, a strong manufacturing sector is good for Northern Ireland.

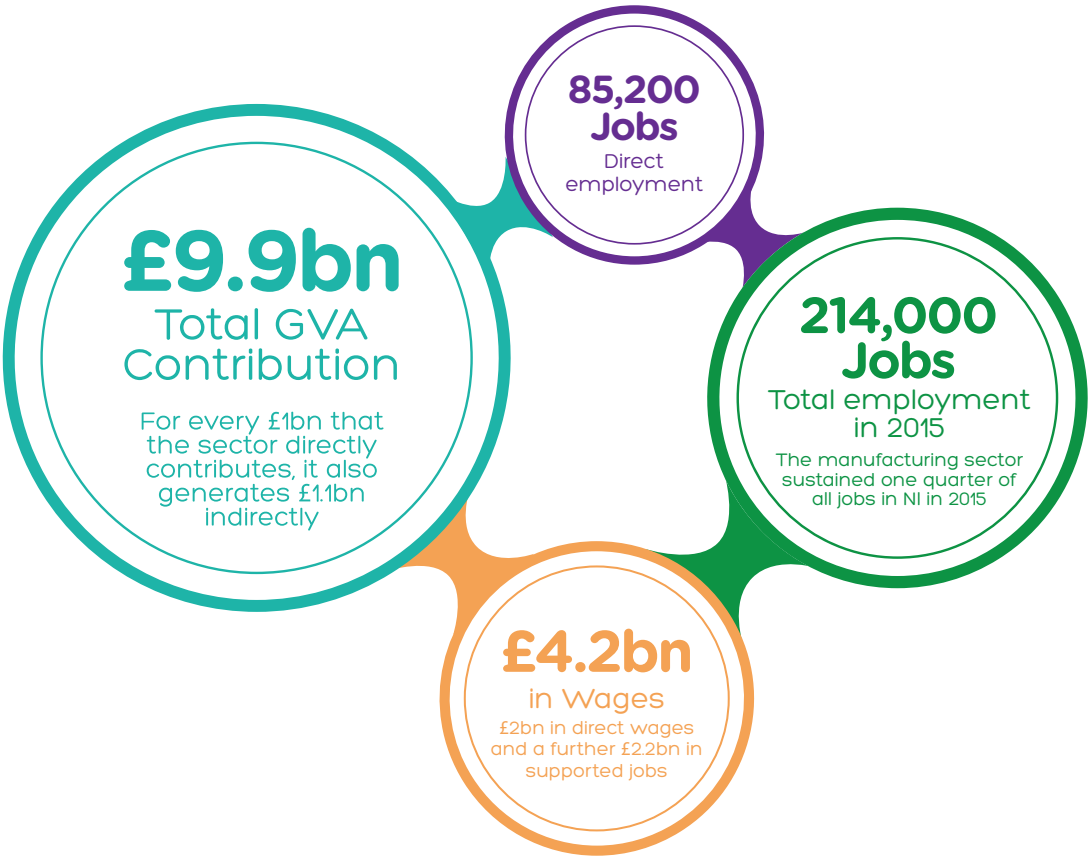
Manufacturing makes a substantial contribution to the Northern Ireland economy.
In 2015 the sector directly provided 85,200 jobs and made a Gross Value Added contribution of £4.7 billion to GDP (measured in 2012 prices). This is equivalent to more than 10 percent of all jobs and 14 percent of total economic output in the region. Manufacturing is the third largest employer and the second largest sector in terms of economic output. It accounts for a larger proportion of the economy in Northern Ireland than in the UK as a whole reflecting the strong manufacturing base that has existed there since the nineteenth century.

Northern Ireland's manufacturing strengths span both traditional and advanced manufacturing sub-sectors. These include other non-metallic mineral products (which includes the manufacture of glass, cement, and ceramics); other transport equipment (which includes air and spacecraft-related machinery, and floating structures); as well as the manufacture of basic pharmaceutical products; and food products. In each of these sub-sectors, the province has a relatively high concentration of employment relative to the UK. As a whole, productivity in Northern Ireland's manufacturing sector, at £55,700 per job in 2015, is 38 percent higher than the total economy average. This difference is even more pronounced for advanced manufacturing, which is, on average, 27 percent more productive than the more traditional part of the industry.

Manufacturing supports jobs and economic growth across all Northern Ireland and in rural and urban areas alike. In Mid Ulster and Mid and East Antrim, manufacturing is the largest employer and accounts for more than a quarter of the economic output. Even in Belfast, which has seen significant economic restructuring in recent decades, the sector provides 11,000 jobs.

The impact of Northern Ireland's manufacturing sector is strongly felt throughout the economy. The contribution that the sector makes extends significantly beyond the jobs, economic activity and wages directly associated with the sector. There is an additional indirect impact which encapsulates the activity and employment supported in the supply chain as a result of the manufacturing sector's procurement of goods and services from

other parts of the Northern Ireland economy. In addition, there is a further induced impact, comprising the economic benefits that arise as the people employed in the manufacturing sector and its supply chain spend their wages in the local consumer economy, for example at retail and leisure establishments.



Including all three channels of economic impact—direct, indirect and induced—the total contribution of manufacturing to the Northern Ireland economy was £9.9 billion in 2015. For every £1 billion of economic output produced by the sector, a further £1.1 billion is created elsewhere in the Northern Ireland economy. In 2015, on top of the £4.7 billion direct GVA contribution that the sector made, it also supported a £3.5 billion contribution to GDP through its supply chain activities and a £1.6 billion wage expenditure GVA contribution, spread widely throughout the Northern Ireland economy. In total, we estimate that in 2015 the sector sustained 214,000 jobs; amounting to a quarter of all jobs in the Northern Ireland economy. For every manufacturing job in Northern Ireland, another 1.5 are supported elsewhere in the economy. By sustaining this level of employment, manufacturing directly contributed £2 billion in wages to its own staff, and a further £2.2 billion in wages through jobs supported outside the sector itself.

The manufacturing sector's impact goes well beyond its immediate or core economic impact. Wide-ranging benefits are created for the Northern Ireland economy as its activities boost economic activity elsewhere in the economy. For example:

- Exports are an important source of income for a small open economy, and manufacturing accounts for almost two-thirds of all of Northern Ireland's export sales. In 2014 the value of manufactured exports stood at £6 billion.
- The manufacturing sector invested £254 million in R&D in 2014, accounting for over 60 percent of total business investment in the province. This helps to support the development of quality products and processes to keep the sector competitive.
- The sector also attracts a large amount of foreign direct investment (FDI). Between 2010 and 2014 manufacturing attracted just under £900 million in FDI, with food, drink and tobacco; and electrical and optical equipment accounting for almost half of the total.

Our forecasts show that over the next 10 years manufacturing will grow faster in Northern Ireland than in any other region in the UK but it also faces substantial challenges from competition from abroad and rising costs. Sustaining these levels of growth will be achieved through increased investment into new technologies and processes that will boost productivity and will be a function of the extent to which the cost base of the sector remains stable relative to its competitors. Any further pressure on costs risks exacerbating the challenges the sector already faces, potentially leading to slower growth in the sector, and with a knock-on impact for economic output and jobs all across the Northern Ireland economy.

Future performance is also dependent on factors outside the control of the sector. Manufacturing is particularly vulnerable to global economic shocks that impact global demand and growth. The extent to which policymakers, at every level of government, seek to foster the opportunity that manufacturing still brings to the Northern Ireland economy, will be decisive in determining the sector's long-term investment outlook and its prospects for future growth.

Fig. 1. Manufacturing in Northern Ireland, 2015

Source: DETINI and Oxford Economics


H & W
H & M

1. Introduction

Manufacturing plays a key role within the UK economy. As well as providing well paid and high skilled jobs, the sector makes disproportionately large contributions to productivity, R&D and innovation. This reflects the highly competitive global market manufacturing operates within, where market share is increasingly determined by the value added of production rather than cost. Manufacturing is also the key driver of exports, therefore a key source of external revenue and providing critical balance to the economy.

In Northern Ireland the importance of the sector is particularly pronounced and it has historically had a strong manufacturing base reaching back as far as the nineteenth century. Despite its strong base, in recent decades domestic manufacturing has faced significant challenges arising from increased global competition. As such the sector has had to carefully consider how it spends its money by re-evaluating its products and revisiting its value chains to try to remain competitive in the global marketplace.

The relevance of manufacturing in modern economies is underlined by the European Commission's recent call for a "European Industrial Renaissance", placing industry at the heart of Europe's economic recovery. This opportunity is exemplified by the performance of manufacturing in Germany, where the sector accounted for 17 percent of employment and 23 percent of GDP in 2015. Reflecting this potential, the Commission's Vice President, Antonio Tajani, has set a goal for manufacturing to account for 20 percent of Europe's GDP by 2020. The Commission has called for action in a whole range of areas that affect competitiveness to deliver this, including policies on energy, transport and digital communications networks.

In this context, this report explores the importance of manufacturing to the Northern Ireland economy, now and in the future, both directly in terms of the GDP and jobs it generates, and indirectly through the subsequent economic activity that it supports all across Northern Ireland. It also benchmarks the wider effects that the sector has in boosting economic activity elsewhere in Northern Ireland's economy, for example, in the contribution it makes by supporting innovation through investment and research and development (R&D) and through improved export performance. Lastly, the report analyses the competitiveness of Northern Ireland's manufacturing sector, and explores some possible challenges going forward.
This report is structured as follows:

- section two examines the core impact of manufacturing in Northern Ireland's economy;
- section three assesses its wider economic impacts, including exports, R&D and FDI;
- section four provides an overview of the cost base of manufacturing in Northern Ireland and its relative competitiveness in the increasingly global marketplace; and
- section five summarise our conclusions.

Methodological Outline

The economic impact of an industry or company is measured using a standard means of analysis called an economic impact assessment. In this report we model the contribution of the manufacturing sector across the whole of Northern Ireland. The report quantifies the three 'core' channels of impact that comprise the sector's 'economic footprint':

- Direct impact – the economic benefit and employment directly generated by the manufacturing sector's activities in Northern Ireland;
- Indirect impact – the economic benefit and employment supported in the sector's supply chain through its procurement of goods and services; and
- Induced impact – the wider economic benefits that arise when employees of the sector and those employed within its supply chain spend their earnings in the local consumer economy, for example in local retail and leisure establishments.

From these channels, the manufacturing sector's total core economic footprint in Northern Ireland is presented, using three key metrics:

- GDP, or more specifically, the manufacturing sector's gross value added (GVA) contribution to GDP;
- Employment, as the number of people employed in the industry and more widely as a result of its activities; and
- Wages, the total value of remuneration offered to the workers associated with these activities.

In addition to these core economic impacts, this report also examines the wider effects of the manufacturing sector's activities in boosting economic activity elsewhere in the Northern Ireland economy. For manufacturing, these benefits are primarily captured in the contribution that it makes to innovation, through research and development (R&D), and to its role in driving exports and foreign direct investment (FDI).

The modelling on which this report is based on computes the economic footprint of the manufacturing sector in 2015 by utilising Oxford Economics' LAD forecasting model. The structure of the model ensures global and national factors have an appropriate impact on the forecasts at the local level. Economic contributions are shown for the whole of Northern Ireland, and broken down by region and sub-sector. Further detail about the economic impact methodology is included in the technical appendix.

2. Manufacturing's Core Economic Contribution

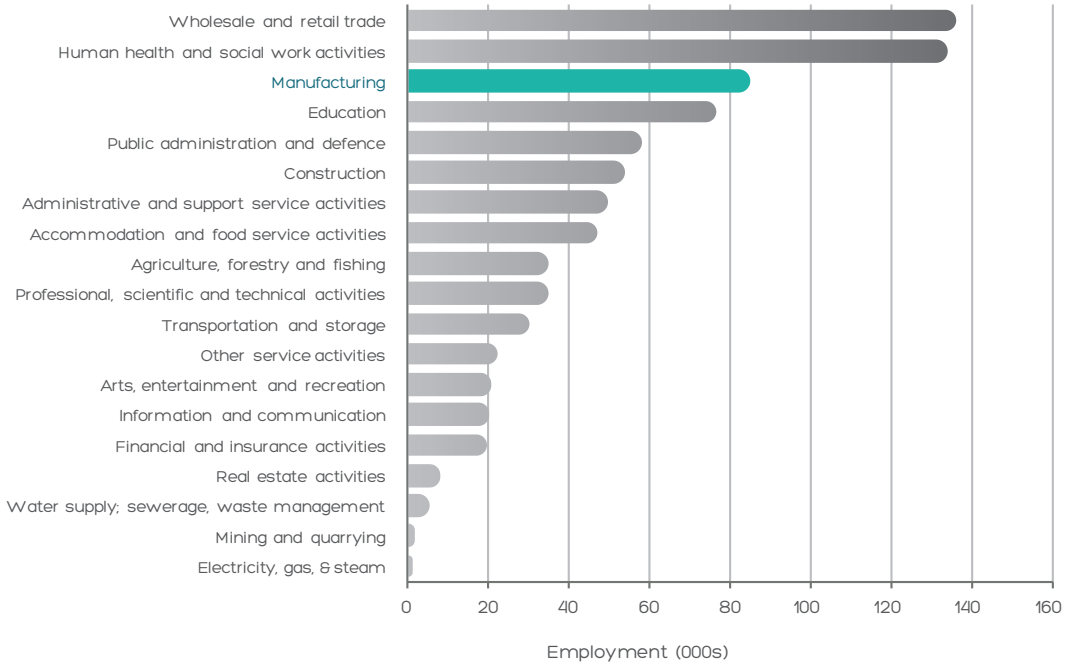
2.1 Direct Impacts

The manufacturing sector has historically played a significant role in the Northern Ireland economy. From the late nineteenth century onwards a strong manufacturing base has existed in Northern Ireland, which has differentiated the northern economy from that of the rest of the island. In more recent decades globalisation and technological advancements have, however, created significant challenges for the region's established manufacturing industries, although such developments have also presented new opportunities. This section of the report will identify the direct impact of the sector and benchmark its characteristics against the rest of the economy, before we explore the wider impacts of the sector on the Northern Ireland economy and examine the sector's competitiveness in the face of these challenges and opportunities.

2.1.1 Employment contribution

In 2015, the manufacturing sector directly contributed in excess of 85,000 jobs in Northern Ireland, equivalent to 1 in 10 of all jobs in the region[1]. Only two sectors - wholesale and retail trade, and health and social work - employed more people.

Fig. 2. Sectoral employment, Northern Ireland, 2015

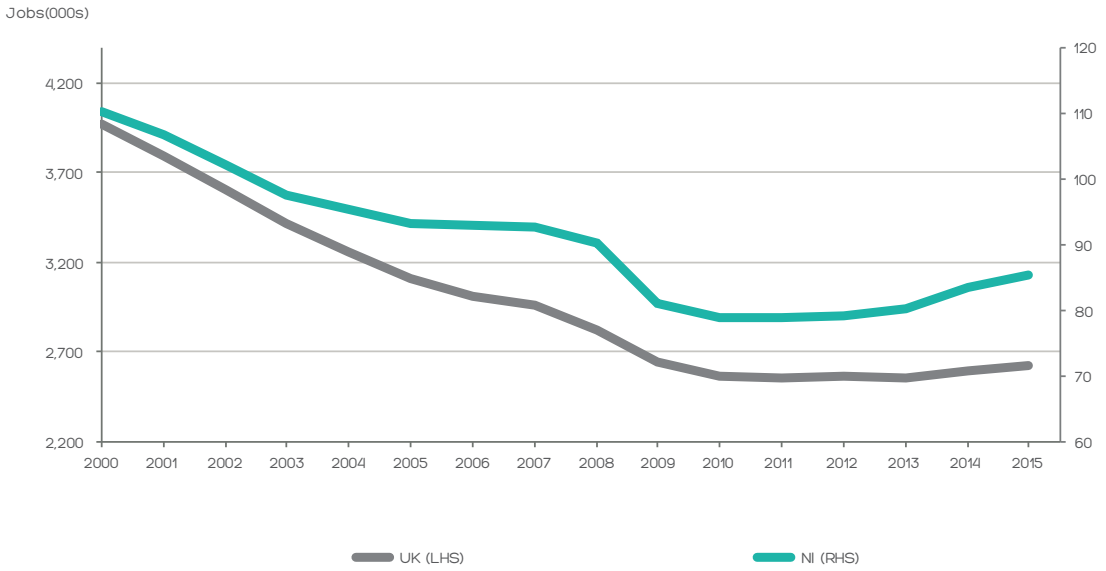


Source: Oxford Economics

1 Jobs figures presented for 2015 are a forecast. Published data from DETI at the time of writing was only available to Q1 2015.

Employment in the sector has fallen by almost a quarter since 2000, with the pace of job losses most significant during the 2008/09 recession. Job numbers have stabilised since, with latest data indicating rising manufacturing employment in Northern Ireland over the last two years. This broadly reflects the UK trend, albeit with the pace of manufacturing job losses in Northern Ireland being slower than across the UK throughout the 2000s, coupled with a stronger recovery since the recession in the province than nationally.

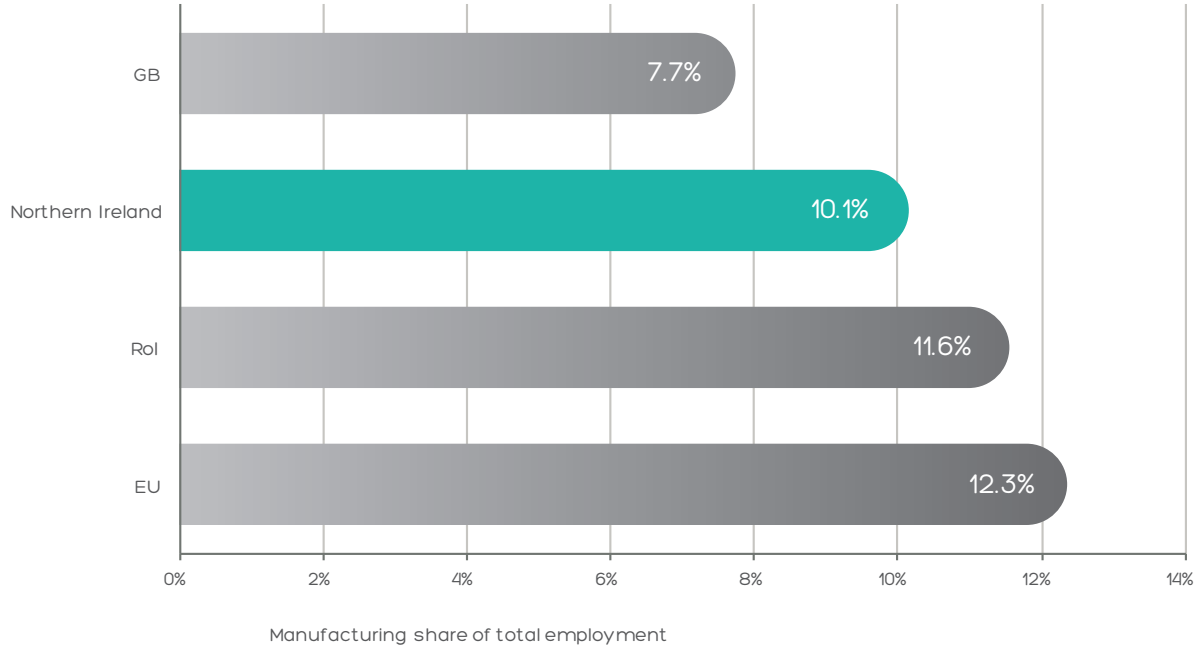
Fig. 3. Manufacturing employment, UK and Northern Ireland, 2000-2015



Source: Oxford Economics

Despite the significant number of manufacturing job losses in Northern Ireland, the sector still accounts for 10 percent of total employment. This is a larger share of employment in Northern Ireland than Great Britain, though smaller than the respective shares of the Republic of Ireland and the EU average, where the sector accounts for around 12 percent of all employment.

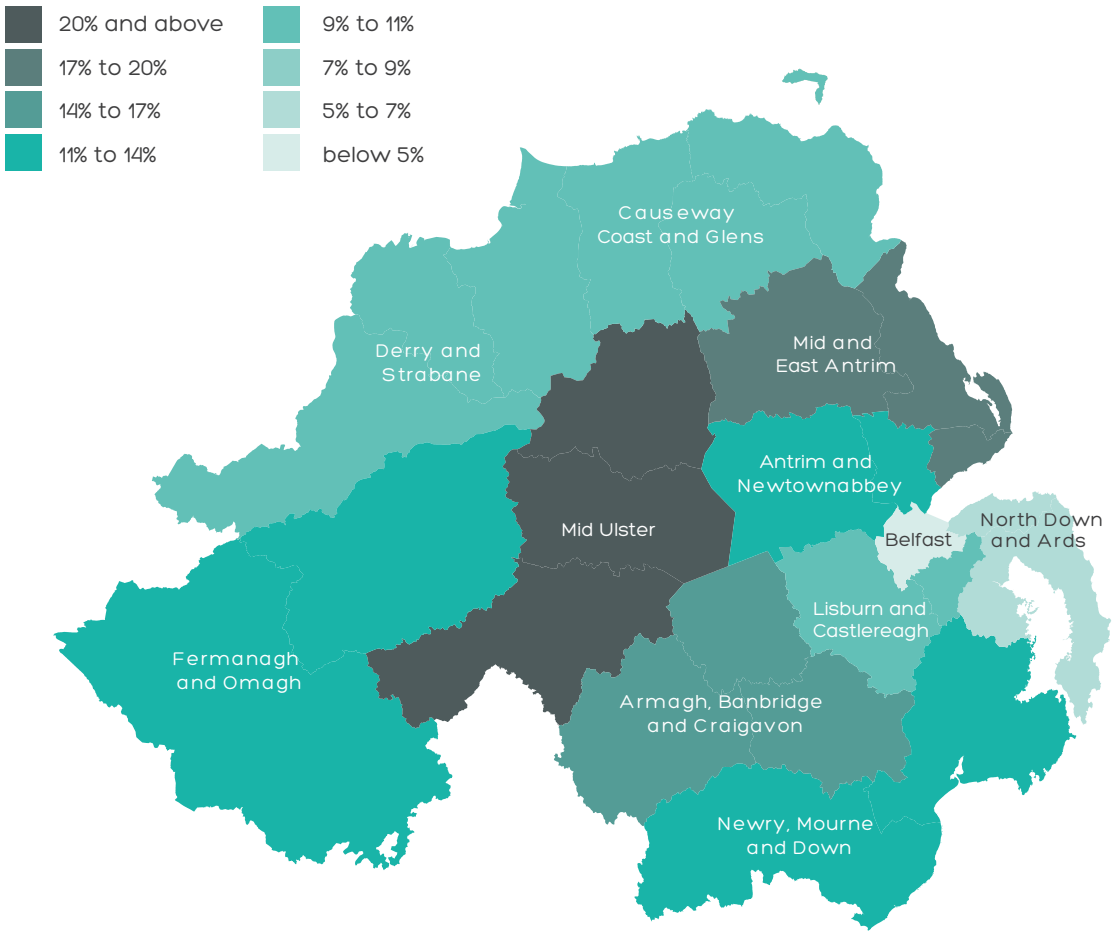
Fig. 4. Manufacturing employment shares, 2015



Source: Oxford Economics

Manufacturing makes a significant contribution to local economies across Northern Ireland. This is particularly so in Mid and East Antrim and Mid Ulster, where manufacturing accounts for 1 in 5 and 1 in 4 jobs respectively—see Figure 5. Belfast is the main exception to this rule, being the only council area where manufacturing accounts for less than 5 percent of total employment. This is partly a feature of economic restructuring in the city over the past two decades which has seen manufacturing's contribution to employment halve, with jobs shifting towards IT and business services. Nonetheless, the city remains an important manufacturing location, providing 11,000 jobs—13 percent of the Northern Ireland total. Mid Ulster (18 percent), Armagh, Banbridge & Craigavon (14 percent) and Mid & East Antrim (12 percent) also account for significant proportions of Northern Ireland's manufacturing employment.

Fig. 5. Manufacturing employment in Northern Ireland, 2015



Source: DETI, Oxford Economics

A high proportion of Northern Ireland's manufacturers are small in employment terms—yet they make a significant contribution within the sector. Business population estimates, published by BIS show that there were 5,095 manufacturing businesses operating in Northern Ireland[2]. Most of these are small firms (employing less than 50 people) but account for over a quarter of total employment and just under one-fifth of total sales. Larger firms (employing 250+) make a disproportionately high contribution to total manufacturing employment and turnover.

Fig. 6. Manufacturing businesses by employee bands in Northern Ireland, 2015

	Business Share	Employment Share	Turnover Share
0-49	92%	27%	19%
50-249	7%	23%	32%
250+	1%	49%	49%

Source: Department of Business, Innovation & Skills

2 BIS, *Business Population Estimates 2015* (2015)

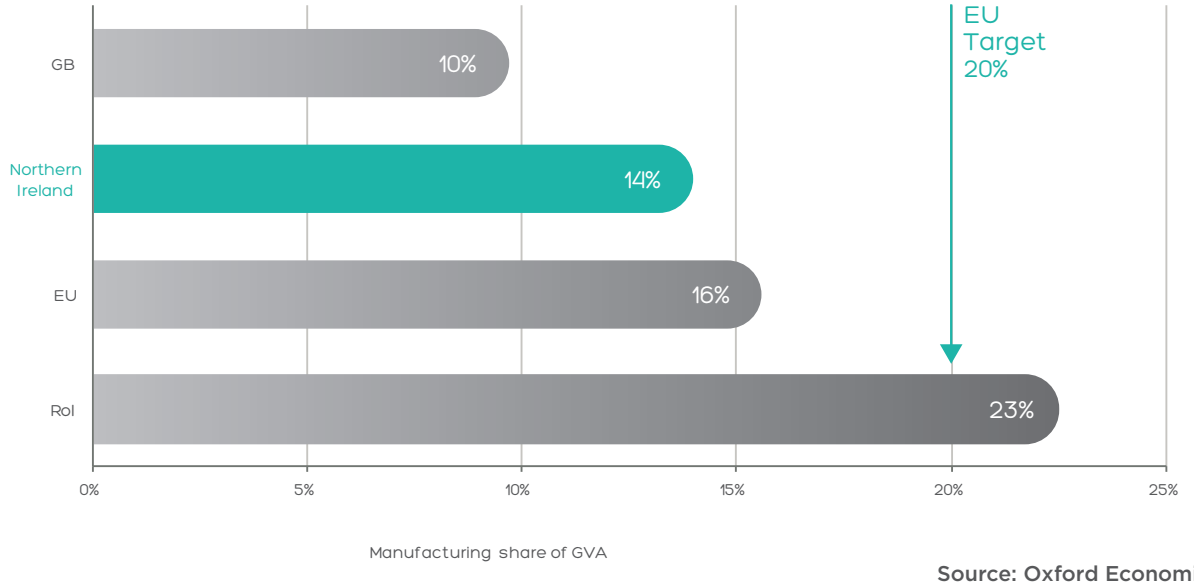
2.1.2 GDP contribution

The proportionate contribution that the manufacturing sector makes directly to the Northern Ireland economy is higher for Gross Value Added (GVA) than for employment—demonstrating its productive nature[3]. We estimate GVA in the sector was £4.7 billion in 2015, measured in 2012 prices, which was equivalent to 14 percent of Northern Ireland's economy. Only the wholesale and retail trade sector made a larger contribution to GDP.

As with employment, manufacturing's share of GVA in Northern Ireland is significantly above the share for Great Britain of just under 10 percent. However, the sector's contribution to GVA is notably lower than the proportional contribution manufacturing makes to GVA in the Republic of Ireland and the EU as a whole, at 23 percent and 16 percent, respectively.

Manufacturing GVA has been relatively volatile since 2000, with periods of expansion largely offset by periods of decline. This means GVA in the sector in 2015 is only a little above what it was in 2000, in real terms. Nonetheless, this has been achieved despite lower employment, and compares favourably to the UK trend. Furthermore, Northern Ireland manufacturing growth has exceeded the total economy average since 2011, whereas UK manufacturing has failed to match the total economy. A consequence of this is that manufacturing GVA in Northern Ireland is higher than its pre-recession peak, an achievement yet to be made nationally.

Fig. 7. Manufacturing GVA shares, 2015



Source: Oxford Economics

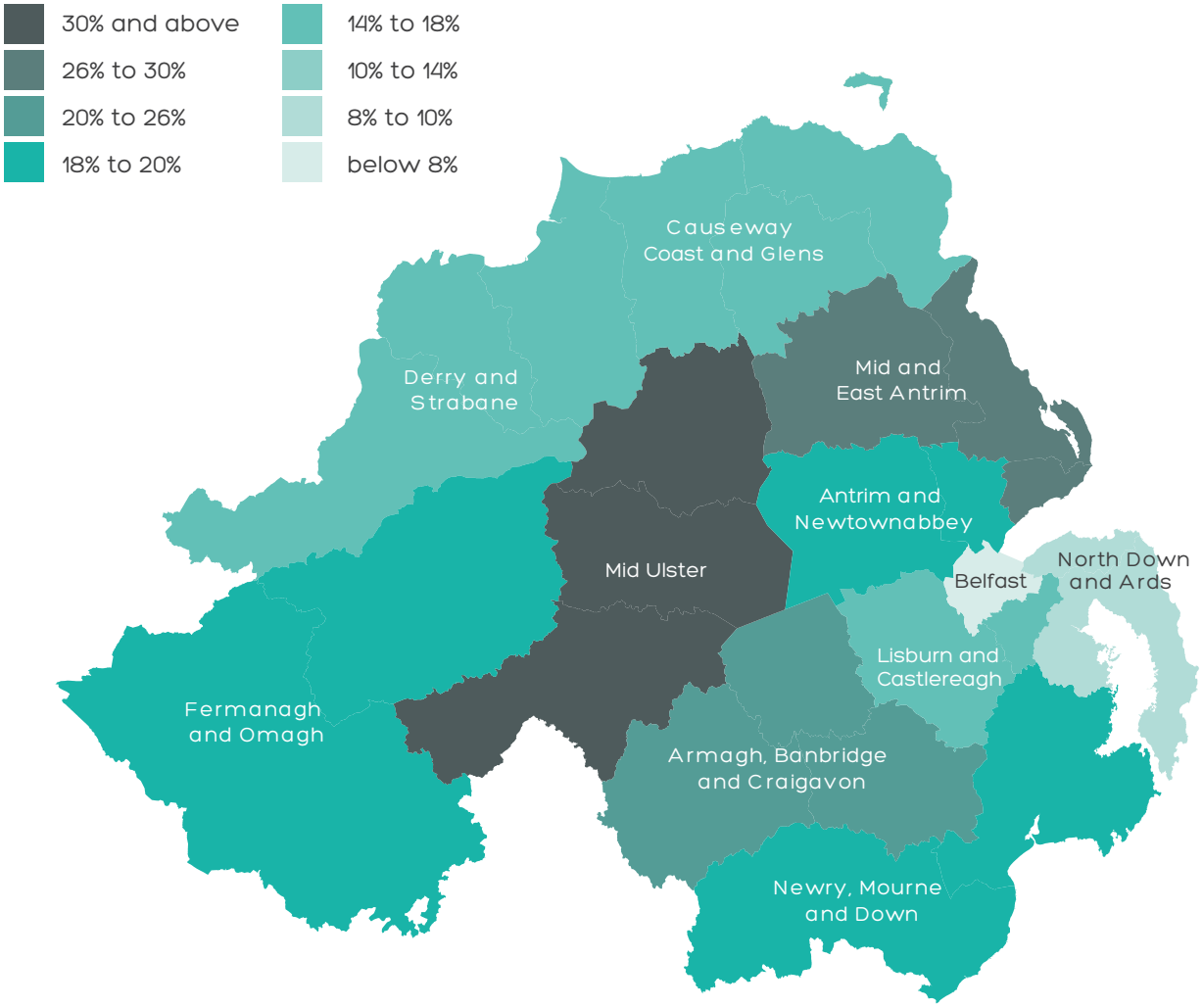
3 Gross Value Added (GVA) is a measure of the value of goods and services produced in an area, industry or sector of an economy, and is equal to output minus intermediate consumption.

Fig. 8. Manufacturing GVA share, Northern Ireland and UK, 1995-2015

Source: Oxford Economics

Looking across the different council areas in Northern Ireland, on the whole the dispersion of manufacturing GVA broadly matches that for employment. So Mid Ulster had the largest manufacturing GVA in 2015, estimated at £823m in constant 2012 prices, and equivalent to 17 percent of the Northern Ireland total. Indeed the share that manufacturing contributes in terms of GVA is, in most council areas, comparable to their shares of manufacturing employment. The main exceptions are Belfast, whose share of GVA (15 percent) is greater than for employment (13 percent), and Fermanagh & Omagh (5 percent and 6 percent respectively). These variations largely reflect the composition of manufacturing in these areas, and different rates of productivity associated with sub-components of manufacturing (see section 2.2). Further detailed breakdowns can be found in section 2.5.

Fig. 9. Manufacturing GVA, 2015



Source: Oxford Economics

2.1.3 Wage contribution

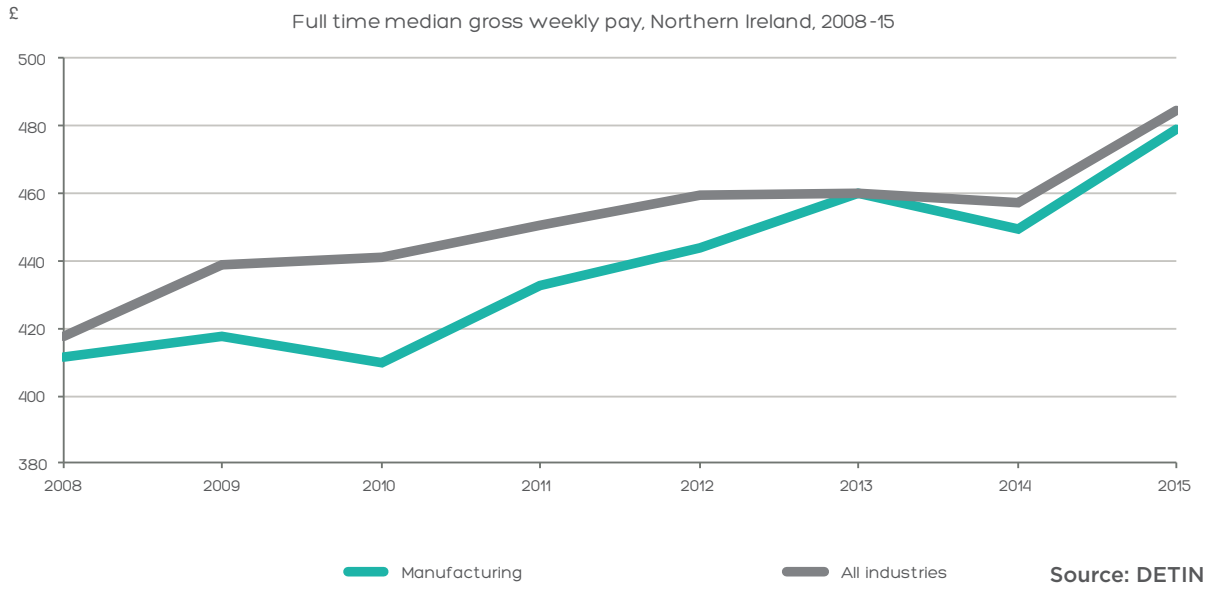
Manufacturing is a sector that pays well. The 2015 Annual Survey of Hours and Earnings (ASHE) reports median hourly wage for all employees in manufacturing in Northern Ireland stood at £11.09, over one-third higher than the recommended living wage[4]. Annual median wages for all employees in Northern Ireland manufacturing stood at £23,331, over 15 percent higher than the all economy level though 14 percent below the average for manufacturing in the UK.

Median wages for full time employees in manufacturing was just under £25,000, 3 percent lower than the all economy level[5]. This was also 12 percent lower than the UK average, with this shortfall broadly comparable to that generally seen across the Northern Ireland economy.

4 The current UK living wage is £8.25 per hour (basic cost of living) according to the Living Wage Foundation.
5 Manufacturing has a lower share of part-time employees compared to the economy as a whole. Part-time employees are generally paid less per annum than full-time employees. This explains why manufacturing pay is lower on average for full-time employees, but higher on average for all employees.

Manufacturing wage growth in Northern Ireland struggled following the recession, with nominal weekly pay levels falling by 0.5 percent between 2008 and 2010. Since 2010 however pay levels have rebounded relatively strongly. Median weekly pay in manufacturing increased by 17 percent between 2010 and 2015, whereas the economy as a whole experienced growth of 10 percent. This means the gap between pay in manufacturing and other sectors has narrowed over the past five years (Figure 10).

Fig. 10. Full time median gross weekly pay, Northern Ireland, 2008-15



Source: DETINI

Within the manufacturing sector there is substantial variation in pay. Many manufacturing sub-sectors provide median wages above the regional median level. The highest wages are seen in the tobacco products and other transport equipment manufacturing sectors with full-time median annual gross pay of £56,100 and £31,600, respectively, in Northern Ireland in 2015. At the other end of the scale, the median annual pay of a full-time employee working in the manufacture of furniture sub-sector was £16,700 in 2015. The large range of earnings potential is likely to be influenced by contrasting productivity rates between the sub-components of the sector.

Fig. 11. Manufacturing full-time employee pay, Northern Ireland, 2015

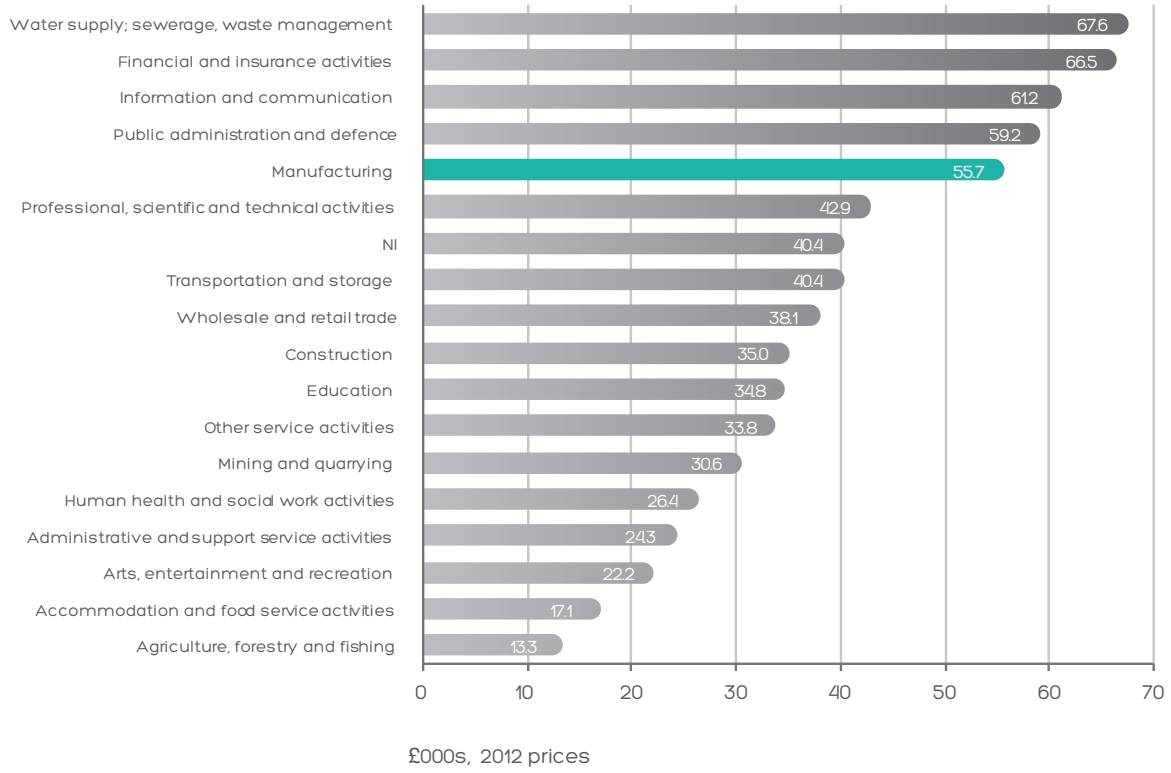
Sector division	Median annual gross pay
Manufacture of tobacco products	£56,100
Manufacture of other transport equipment	£31,600
Manufacture of computer, electronic and optical products	£30,900
Manufacture of rubber and plastic products	£29,400
Manufacture of machinery and equipment	£26,500
Manufacture of fabricated metal products, except machinery and equipment	£25,800
Manufacture of beverages	£24,700
Manufacture of motor vehicles, trailers and semi-trailers	£24,600
Manufacture of basic pharmaceutical products and pharmaceutical preparations	£21,900
Manufacture of other non-metallic mineral products	£21,800
Printing and reproduction of recorded media	£18,000
Manufacture of food products	£17,900
Manufacture of furniture	£16,700
All Manufacturing	£25,000
Northern Ireland	£25,800

Source: DETINI

2.2 Productivity Impact

Improvement in productivity is increasingly important in developed economies, as it allows more to be created from available resources. Manufacturing productivity, measured as GVA per job in 2012 prices, was £55,700 in 2015, 38 percent higher than the total economy average of £40,400. Manufacturing productivity in Northern Ireland is six percent lower than the GB average, but this is consistent with lower productivity across the economy as a whole.

Fig. 12. Sectoral productivity, Northern Ireland, 2015



Source: Oxford Economics

In discussions about productivity and economic development, much is made of the distinction between what is known as advanced manufacturing and more traditional manufacturing. Advanced manufacturing is often assumed to bring additional benefits as a result of the improvements to products and processes that it makes through the use of technology. Accurately defining advanced manufacturing is, however, quite difficult since, for example, a low-tech product might be produced using advanced manufacturing techniques. Therefore advanced manufacturing is perhaps better conceived of as a concept than as a clearly defined sector. Nonetheless, looking at the economic contribution of advanced manufacturing versus traditional manufacturing is potentially instructive. The OECD subdivides manufacturing into technology classes based on the relative research and development intensity of manufactured products[6]. Using these guidelines as a starting point we have constructed a broad definition of advanced manufacturing from which to base comparisons, including activities such as the manufacture of electrical equipment, chemicals and transport among others. The sectors included are set out in full in the accompanying appendix.

6 The Work Foundation, *A knowledge economy programme report* (2009)

Based on this definition we are able to estimate that advanced manufacturing in Northern Ireland accounts for 46 percent of total manufacturing GVA, but only 40 percent of total manufacturing jobs. This reflects, unsurprisingly, differences in productivity; with advanced manufacturing being on average is 27 percent more productive than the more traditional part of the industry. We estimate that advanced manufacturing GVA per job was £63,000 in 2015, compared to £49,600 in more traditional manufacturing sectors. Both manufacturing types are however found to be more productive than the total economy average.

Fig. 13. Advanced and traditional manufacturing, Northern Ireland, 2015

Source: Oxford Economics

At the local level, we see that advanced manufacturing jobs are concentrated in Mid and East Antrim, Mid Ulster and Antrim and Newtownabbey, where employment concentrations in the more advanced aspects of manufacturing were typically 50 percent higher than the Northern Ireland average.

Fig. 14. Advanced manufacturing related employees, Northern Ireland Council areas, 2013

Local Government District	Employees
Belfast	7,730
Antrim and Newtownabbey	4,120
Mid Ulster	3,610
Mid and East Antrim	3,560
Newry, Mourne and Down	3,490
Derry and Strabane	2,560
Armagh, Banbridge and Craigavon	2,390
Lisburn and Castlereagh	2,260
North Down and Ards	1,020
Causeway Coast and Glens	890
Fermanagh and Omagh	890

Note: See the appendix for the definition used for advanced manufacturing
Source: DETNI

CASE STUDY:

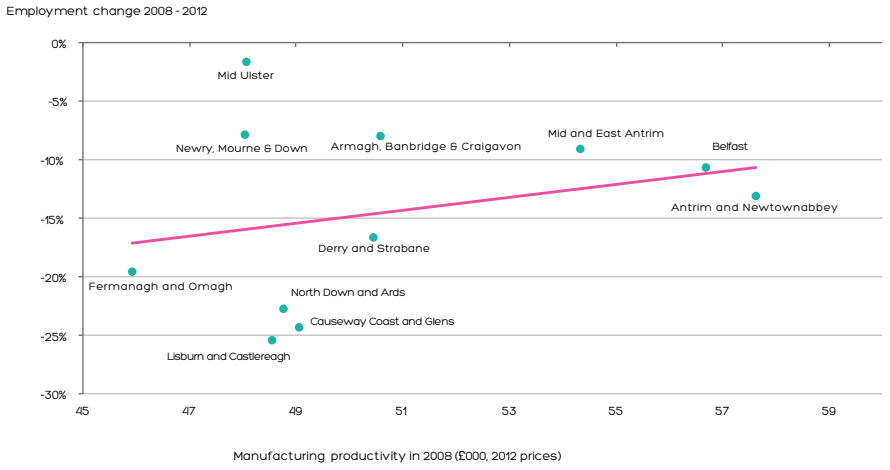
PRODUCTIVITY AND INNOVATION IN NI LOCAL ECONOMIES

Higher productivity is associated with a number of economic benefits. Competition from emerging nations, especially on cost, necessitates that firms in developed economies innovate to remain competitive. In this way they seek to differentiate themselves through improvements in value adding processes. Such improved productivity locally not only benefits local businesses but offers the opportunity for improved wages for local workers and the better utilisation of local resources.

Further, investment in innovation can lead to the development of new markets, whilst at the same time enabling companies to remain, or become, more competitive in existing markets. This again offers the opportunity for increased profitability and/or an improved resilience in the face of difficult economic conditions. Figure 15 illustrates how this played out in Northern Ireland's manufacturing sector following the recession. The sector as a whole contracted by 12 percent in jobs terms between 2008 and 2012. However, at the local level there was a broad range in the extent of manufacturing job losses, with the more productive areas experiencing less of a contraction, on average.

In addition, innovative industries are often the source of new processes and products which offer greater long-term economic returns. They are likely to require relatively higher numbers of highly skilled staff, who in turn demand competitive wages. Spill-over effects from these industries can, in turn, influence productivity in quite unrelated sectors, thereby compounding benefits and improving economic outcomes for the local labour force. We estimate that the three council areas with the highest rates of manufacturing productivity in 2015 (Belfast, Mid and East Antrim and Antrim and Newtownabbey) also offered the highest wages.

Fig. 15. Manufacturing productivity and job losses following the recent recession, Northern Ireland council areas



Source: Oxford Economics

2.3 Sectoral Contributions

As we have seen productivity is, in part, related to type of manufacturing, and whether it is more traditional or can be better characterised as advanced manufacturing. Northern Ireland's manufacturing sector encompasses a broad range of activities. The largest components are the manufacture of food, beverages and tobacco products, transport equipment, and rubber and plastics—much of the activity in all of these sectors can be thought of as 'traditional' activities.

Fig. 16. Manufacturing GVA shares, Northern Ireland, 2015

Manufacturing sub-sectors	Share of manufacturing GVA
Food products, beverages and tobacco	22.2%
Transport equipment	17.2%
Rubber, plastic and other non-metallic mineral products	13.7%
Basic metals and metal products	8.3%
Machinery and equipment	7.3%
Wood, paper products and printing	6.8%
Computer, electronic and optical products	5.6%
Other manufacturing and repair	4.9%
Basic pharmaceutical products	4.6%
Electrical equipment	4.0%
Textiles, wearing apparel and leather products	2.8%
Chemicals and chemical products	2.7%
Coke and refined petroleum products	0.1%

Source: Oxford Economics

To examine more closely the sectoral structure of Northern Ireland's manufacturing sector, we are able to identify where employment specialisation exists in Northern Ireland's manufacturing sector relative to the national average by making use of location quotients (LQs).[7] An LQ of greater than one indicates that the Northern Ireland economy has a higher concentration of that particular sector than the UK as a whole.[8]

7 The analysis uses the latest Census of Employment – a two-yearly survey of all employers, the latest data relates to 2013.
8 Results will be calculated at the two-digit SIC07 sectoral level, in terms of relative employment compared to the UK economy as a whole. To protect confidentiality, we are unable to publish in this report either the number of employees or employment shares within identified sectors. The analysis focuses on sectors with a minimum of 1,000 employees in Northern Ireland.

Almost half of all Northern Ireland's manufacturing sectors had employment concentrations larger than the UK as a whole. The manufacture of other non-metallic mineral products had the largest LQ at 2.3—indicating that the sector is more than twice as concentrated in Northern Ireland, as it is in the UK. Other sectors—including the manufacture of other transport equipment and basic pharmaceutical products—are also relatively highly concentrated in Northern Ireland. In aggregate, eight manufacturing sub-sectors appear in Northern Ireland's top 15 sectors in terms of relative employment concentration.

Fig. 17. Employment specialisms (2-digit level), Northern Ireland, 2013

Sector division	LQ
Other mining and quarrying	3.8
Manufacture of other non-metallic mineral products	2.3
Manufacture of other transport equipment	2.2
Manufacture of basic pharmaceutical products and pharmaceutical preparations	2.1
Manufacturing of food products	2.0
Civil engineering	1.6
Public administration and defence; compulsory social security	1.6
Activities of membership organisations	1.5
Manufacture of electrical equipment	1.5
Manufacture of wood and of products of wood and cork, except furniture	1.5
Human health activities	1.5
Manufacture of rubber and plastic products	1.4
Water collection, treatment and supply	1.4
Waste collection, treatment and disposal activities; materials recovery	1.3
Manufacture of paper and paper products	1.3

Source: Oxford Economics

2.4 Indirect And Induced Impacts

This report has shown how the manufacturing sector makes a significant, and above average direct contribution to the economy in terms of jobs, GVA and wages. As set out in the methodology box in the introduction, the economic footprint of the manufacturing sector extends much further than its direct activities.

In order to quantify the full contribution of manufacturing to the Northern Ireland economy it is also important to consider additional 'indirect' and 'induced' effects by following a standard analytical technique known as economic impact assessment. This approach considers three channels of impact arising from the manufacturing sector: direct, indirect and induced impacts:

- the direct impact reflects the jobs, GVA and wages generated by the immediate activity of the sector itself, as summarised in section 2.1;
- the indirect impact encapsulates the economic activity supported in the manufacturing sector's supply chain as a result of its procurement of goods and services;
- the induced impact comprises benefits arising as the people in employment (both in manufacturing and in the supply chain) spend their wages generating further rounds of economic activity.

Manufacturing has a relatively high multiplier between these different channels that makes investment in manufacturing particularly effective as a way of fuelling economic growth: investment has a knock-on effect in terms of GDP and jobs that ripples out to other parts of the economy.[9] We estimate that manufacturing had a GVA multiplier of 2.1 in Northern Ireland in 2015, meaning that for every £1 of direct GVA produced by the sector, an additional £1.10 was created in the wider regional economy.[10] We estimate that the total economic contribution of manufacturing in Northern Ireland was therefore £9.9 billion in GVA, equivalent to almost one-third of total GVA in the economy. In 2015 this consisted of:

- £4.7 billion in direct impacts;
- £3.5 billion in indirect impacts through the supply chain; and
- £1.6 billion in induced impact through spending of people employed in manufacturing and its supply chain.

This level of economic activity supported 214,400 jobs in total in the economy in 2015; this is equivalent to 1 job in every 4 in Northern Ireland. In 2015 this consisted of:

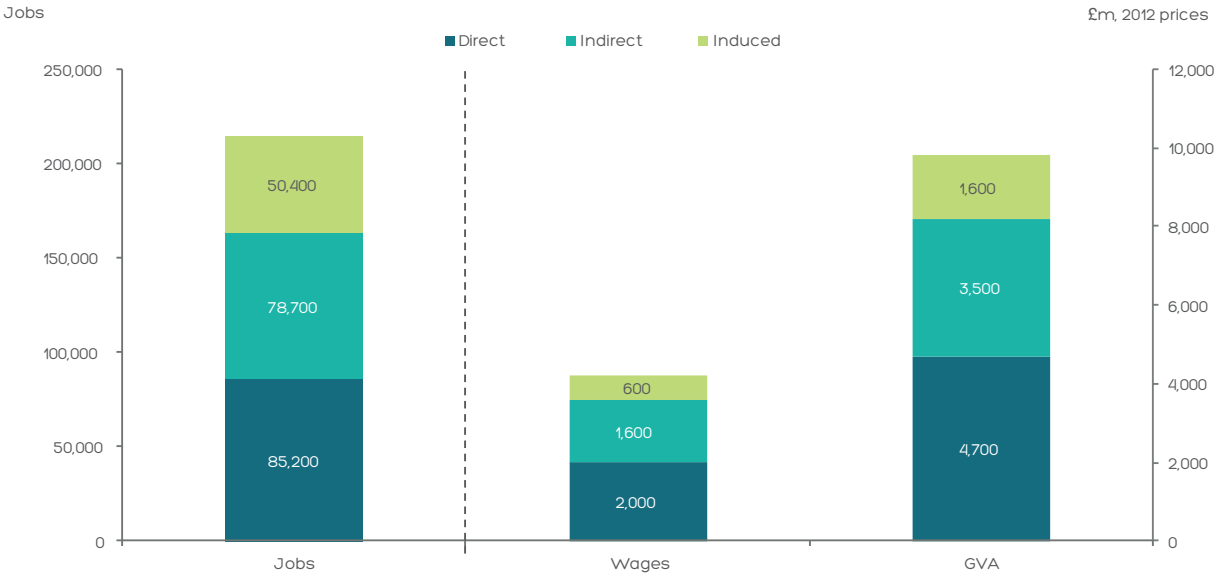
- 85,200 direct jobs in manufacturing;
- 78,700 indirect jobs within the supply chain; and
- 50,400 jobs induced jobs as employees in manufacturing and its supply chain spent their wages.

9 See the appendix for a sectoral GVA multiplier comparison in Northern Ireland.
10 We have calculated these multiplier effects with the 2010 UK input-output tables. An input-output model shows who buys what from whom in the economy. It shows the major spending flows from "final demand" (consumers, government, investment etc.) and what each sector buys from every other sector (or the supply chain). Our estimates have been presented in terms of their purchasing power in a single "base" year. This base year is 2012 in all ONS National Accounts and in Oxford Economics' suite of forecast models. Prices expressed in 2012 terms are also known as "2012 prices" or "real prices".

For every manufacturing job in Northern Ireland, another 1.5 are supported outside the sector. By sustaining this level of employment manufacturing supported £4.2 billion in total wages, in 2015 this consisted of:

- £2.0 billion in direct wages;
- £1.6 billion in wages in the supply chain;
- £0.6 billion in wages from jobs induced as employees in manufacturing and its supply chain spent their wages.

Fig. 18. Total Impact of Manufacturing, 2015



Source: Oxford Economics, ONS, DETINI

2.5 Regional Contributions

The total contribution of the manufacturing sector can also be estimated for each council area. We estimate total GVA to be largest in Mid Ulster, followed closely by Belfast—both areas where the direct impact of GVA was largest. The indirect impact is larger in Belfast than Mid-Ulster. This reflects that Belfast has a higher ratio of direct to indirect benefits as firms in the city can source more of their supply chain from within the local area itself, whereas firms in rural or peripheral areas are likely have to source more of their supply chain from other parts of Northern Ireland. In addition, firms outside Belfast are likely to use services that are disproportionately based in Belfast, such as accountants and lawyers.

Fig. 19. Manufacturing GVA impacts (£m, 2012 prices), Northern Ireland, 2015[11]

	Direct	Indirect	Induced	Total
Antrim and Newtownabbey	400	280	130	800
Armagh, Banbridge and Craigavon	680	440	230	1,350
Belfast	610	660	170	1,440
Causeway Coast and Glens	220	150	100	480
Derry and Strabane	290	210	100	590
Fermanagh and Omagh	280	200	100	580
Lisburn and Castlereagh	300	210	110	610
Mid and East Antrim	570	400	200	1,170
Mid Ulster	840	570	260	1,670
Newry, Mourne and Down	390	270	150	820
North Down and Ards	160	130	80	370
Northern Ireland	4,700	3,500	1,600	9,900

Source: Oxford Economics, ONS, DETINI

The total employment impact is also largest in Mid Ulster and Belfast. Again both areas have high levels of direct employment from the sector, so we expect high indirect and induced impacts for these areas. Again, multiplier impacts are highest in Belfast, which means it has the third highest direct impact, but second highest total impact, overtaking Armagh, Banbridge & Craigavon.

11 Numbers may not add up due to rounding

Fig. 20. Employment impacts of manufacturing, Northern Ireland, 2015[12]

	Direct	Indirect	Induced	Total
Antrim and Newtownabbey	7,200	6,300	3,800	17,300
Armagh, Banbridge and Craigavon	12,200	10,200	6,900	29,200
Belfast	10,900	14,100	5,400	30,400
Causeway Coast and Glens	4,000	3,600	3,200	10,800
Derry and Strabane	5,200	4,700	3,100	13,000
Fermanagh and Omagh	5,100	4,500	3,100	12,700
Lisburn and Castlereagh	5,400	4,800	3,300	13,500
Mid and East Antrim	10,200	8,600	6,400	25,200
Mid Ulster	15,100	12,800	7,800	35,700
Newry, Mourne and Down	7,100	6,200	4,800	18,000
North Down and Ards	2,900	2,900	2,700	8,500
Northern Ireland	85,200	78,700	50,400	214,400

Source: Oxford Economics, ONS, DETINI

As with employment and GVA, Mid Ulster and Belfast are also estimated to have the highest levels of total earnings supported by the manufacturing sector, again with the multiplier in Belfast higher than in other council areas.[13]

Fig. 21. Wage impacts of manufacturing (£m, 2012), Northern Ireland, 2015[12]

	Direct	Indirect	Induced	Total
Antrim and Newtownabbey	170	130	50	340
Armagh, Banbridge and Craigavon	280	200	90	570
Belfast	250	280	60	600
Causeway Coast and Glens	90	70	40	200
Derry and Strabane	120	90	40	250
Fermanagh and Omagh	120	90	40	250
Lisburn and Castlereagh	130	90	40	260
Mid and East Antrim	240	170	80	490
Mid Ulster	350	260	100	710
Newry, Mourne and Down	160	120	60	350
North Down and Ards	70	60	30	160
Northern Ireland	2,000	1,600	620	4,200

Source: Oxford Economics, ONS, DETINI

12 Numbers may not add up due to rounding
13 Wage data for manufacturing is unavailable at a local level. Therefore estimates are based on Northern Ireland manufacturing earnings data sourced from ASHE, and council area employment estimates.

2.6 Future Impact

It is clear that manufacturing has a large economic footprint in Northern Ireland. In addition, the sector is likely to play a key role in driving growth in the economy over the next decade. Our forecasting techniques incorporate national/ regional outlooks, historical trends and fundamental economic relationships which interlink various elements of the outlook.

In this section we present our GVA and employment forecasts for the sector through to 2025.[14] The forecasts are policy neutral and are in line with our current expectations of global trade and demand. Therefore there are a number of factors that could impact the sector's performance over the next decade relative to our expectations.

These include general macroeconomic factors that can impact on growth expectations—such as the performance of the Chinese economy, volatility of energy prices and exchange rates. In addition, policy decisions, whether taken at the Executive, UK or EU level, can also have an impact on expected performance. These include the upcoming referendum on the UK's membership of the EU as well as any changes in regulation at the domestic or EU level.

Finally, the forecasts do not make allowances for the recent announcements by Bombardier to cut 1,080 jobs in 2016 and 2017, or the job losses that will be incurred with the closing down of JTI Gallagher's and Michelin in 2017 and 2018, respectively.

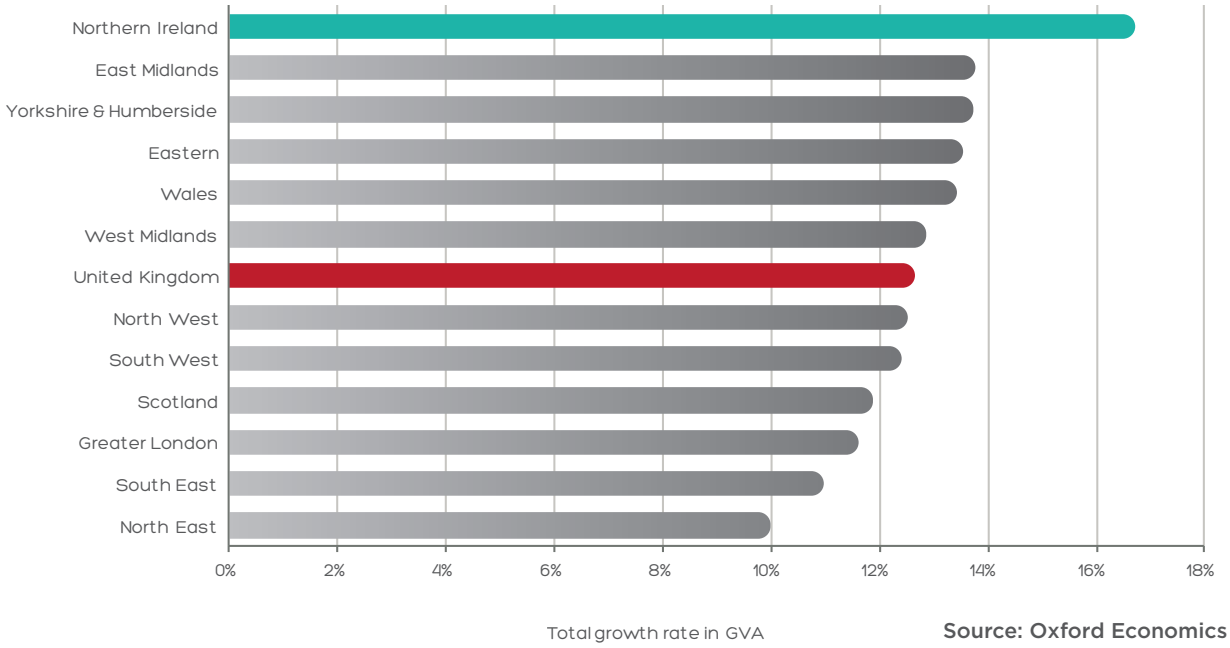
2.6.1 Future GDP contribution

We expect strong growth for the manufacturing sector in Northern Ireland over the next 10 years. We forecast that total economic output in manufacturing in Northern Ireland will be £5.5 billion (2012 prices) in 2025. This represents an increase of £795 million or average growth of almost 17 percent over the forecast period as a whole. This will make growth in the manufacturing sector stronger than in all other regions in the UK. It will also be the strongest driver of total growth in Northern Ireland, except for in wholesale and retail trade.

All manufacturing sub-sectors are expected to grow over the forecast period, with basic pharmaceutical products, and manufacture of food, beverages and tobacco products the strongest performers, with forecast total growth of 27 percent and 23 percent, respectively.

14 All figures reported in this section refer to direct GVA and employment forecasts.

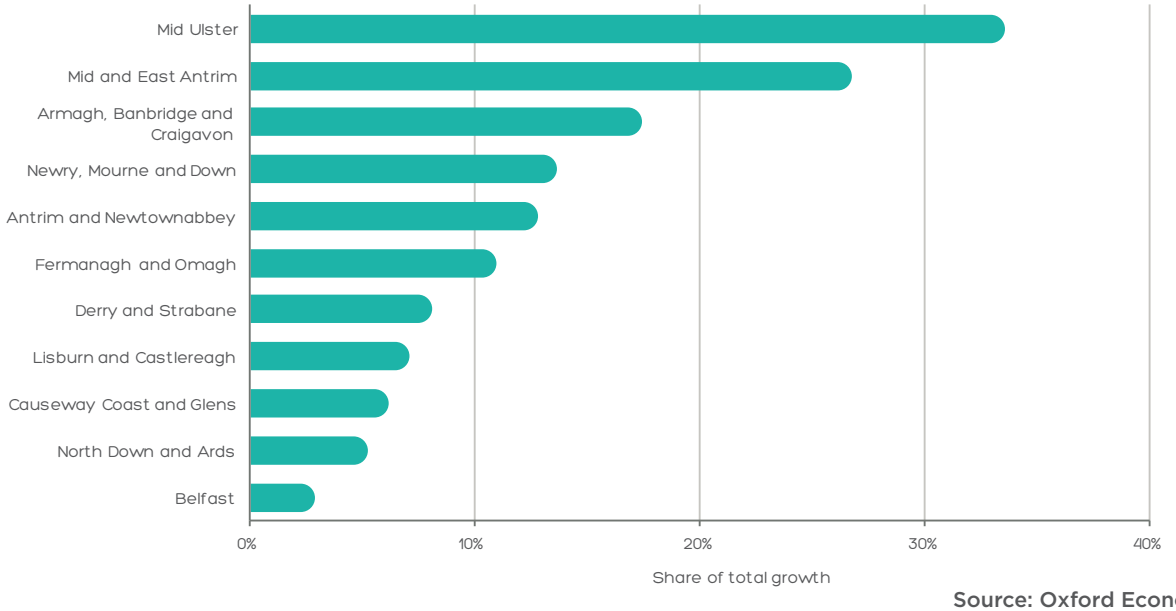
Fig. 22. Total Manufacturing GVA growth, UK regions, 2015-2025, constant prices



Source: Oxford Economics

All local council areas will see significant manufacturing growth over the period, with Mid Ulster; Mid & East Antrim; and Armagh, Banbridge & Craigavon seeing the strongest growth. The sector will also continue to play an important role in driving economic growth throughout the region, with the largest total impact in Mid Ulster, where the sector accounts for one-third of total GVA growth, and Mid and East Antrim where the sector accounts for over a quarter of total growth.

Fig. 23. Contribution of manufacturing to total GVA growth by local council area, 2015-2025, constant prices



Source: Oxford Economics

2.6.2 Employment forecast

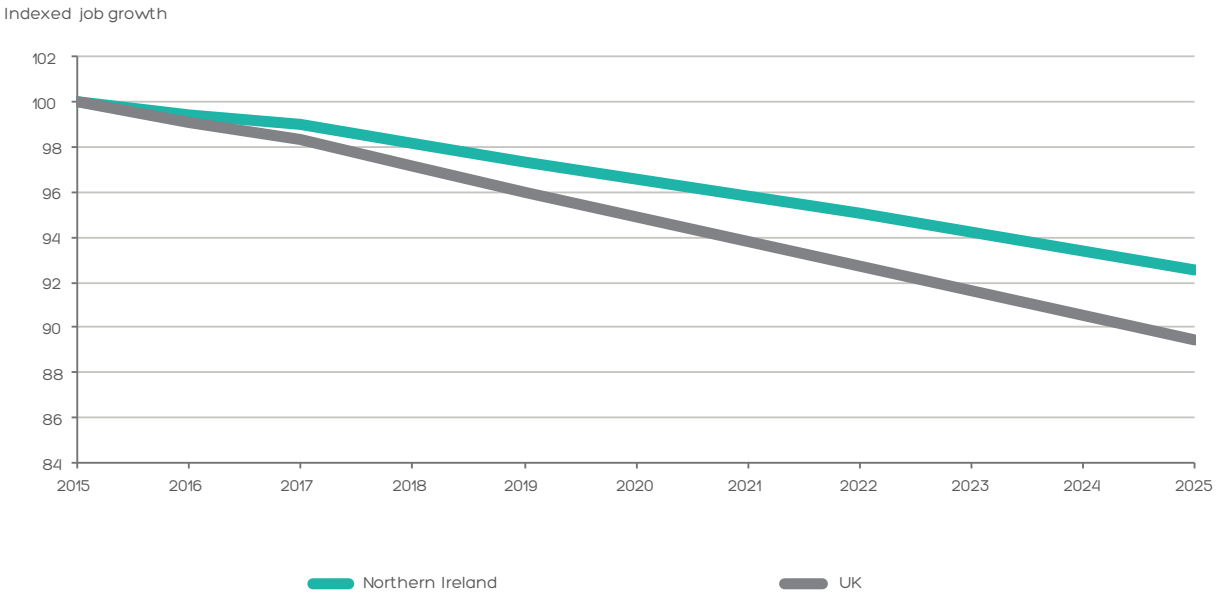
This sector's robust growth, as set out above, will only be achieved through increased investment into new technologies and processes that will boost productivity. However, the increasing productivity of the sector is likely to lead to a decline in employment over the forecast period. We expect manufacturing employment to fall by 7 percent over 10 years with the loss of 6,300 jobs—this will see manufacturing's share of total employment fall to just over 9 percent.[15]

The decline in manufacturing employment will not be unique to Northern Ireland, with jobs in the sector expected to decline in every region of the UK by 2025. In fact, the pace of the decline in manufacturing in Northern Ireland will be slower than the UK average of 11 percent, due in part to the sectoral makeup of manufacturing in the region.

All sub-sectors of manufacturing will see declines in employment. However, the largest sub-sector—food, beverages and tobacco—will see a slower decline in employment than average, falling by 400 jobs, or 2 percent. The largest falls in employment will be in the transport and equipment, and rubber and plastic, and other non-metallic mineral products sub-sectors, which will see total jobs fall by just over 1,000 each.

Employment in the sector will fall across all local council areas, with the largest decline of 1,200 jobs in Belfast, equivalent to a contraction of 14 percent. Mid Ulster and Mid and East Antrim, the areas where manufacturing accounts for the most jobs, will see a 4 percent reduction or a fall in the level of jobs of 600 and 500, respectively.

Fig. 24. Forecast manufacturing job growth, Northern Ireland and UK, 2015-2025



Source: Oxford Economics

15 Our employment forecast is for the net change in jobs over the next 10 years. This does not imply there will be no jobs created in certain industries within manufacturing or employment opportunities through the replacement of existing staff that retire or move to another sector. However, overall, we expect the number of jobs lost to exceed the total created.

3. THE WIDER ECONOMIC CONTRIBUTION OF MANUFACTURING

In addition to the core economic impacts that the manufacturing sector in Northern Ireland generates through its activities and as their effect ripples out through the economy in the form of indirect and induced contributions, this report also examines the wider effects that the sector has in boosting economic activity elsewhere in the economy. For Northern Ireland's manufacturing sector these effects are primarily captured in the contribution that the sector makes to innovation, including through research and development (R&D) spending, as well as its contribution to UK exports and to inflows of Foreign Direct Investment (FDI).

3.1 Exports

For small open economies, exports are an important driver of economic growth. They provide an external source of demand which can help compensate for a lack of domestic demand, and allow a developed economy to tap into potentially faster growth in emerging markets. Exports also help to support demand in non-export sectors through economic multiplier effects.

In 2012 manufacturing accounted for 61 percent of all goods and services exported by Northern Ireland companies.[16] Consequently, as Northern Ireland's largest exporting sector, and therefore source of export revenue, manufacturing plays an important role in supporting the province's economic growth.

The Manufacturing Sales and Exports Survey, undertaken by the Department of Enterprise, Trade and Investment of Northern Ireland (DETINI), provides more timely information concerning the performance of Northern Ireland manufacturing sales and exports. It reveals that manufacturing turnover reached £18.1 billion in 2014.[17] Of this sales total, £14.3 billion was generated from markets outside of Northern Ireland—equivalent to 79 percent of total sales. Some £8.3 billion (58 percent) of these external sales were destined for the British market and the remaining £6 billion consisted of exports. Manufacturing exports in 2014 actually fell by 1.5 percent from the 2013 level, caused by a decrease in sales to the rest of the world.

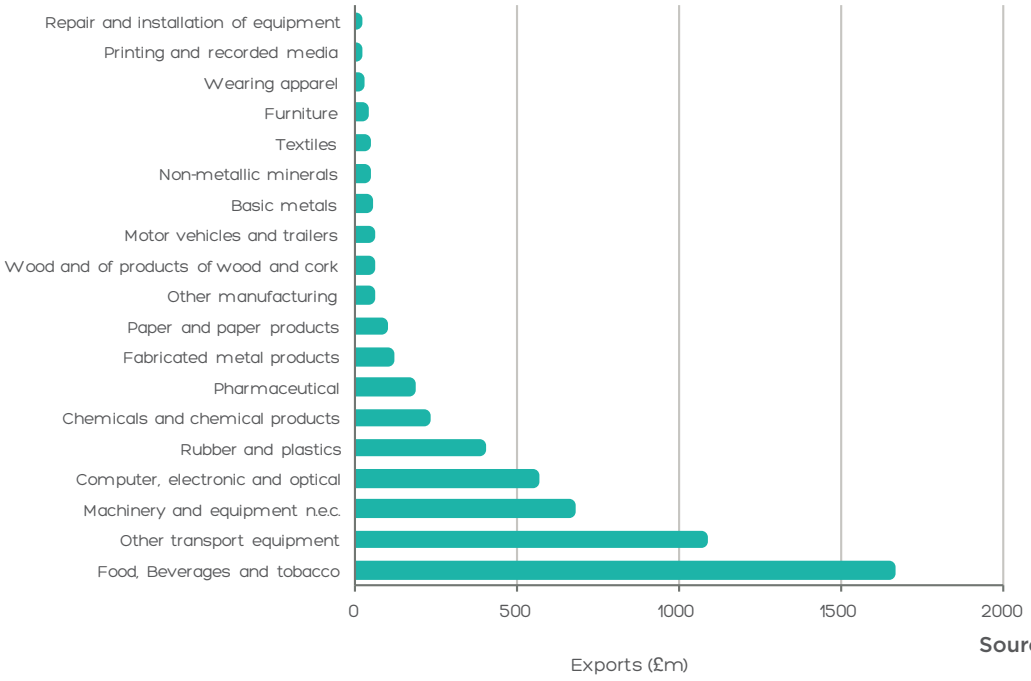
16 DETINI, *Broad economy exports* (2015). 2012 is the latest year available for an estimate of exports for total goods and services.
17 DETINI, *Manufacturing sales and exports survey* (2015)

Fig. 25. NI manufacturing sales by broad destination, 2011-2014, current prices

Source: DETINI

The manufacture of food, beverages and tobacco accounted for the largest share of manufacturing exports at 28 percent. Indeed, exports originating from this sub-sector were more than 50 percent greater than the next largest manufacturing sub-sector—the manufacture of other transport equipment. Furthermore, both sectors have grown consistently over the last three years.

Fig. 26. Northern Ireland manufacturing exports, 2014



Source: DETINI

Manufacturing firms of all sizes contribute to Northern Ireland's exports. In 2014, small- and medium-sized firms (firms with less than 250 employees) posted export sales of £1.9 billion, accounting for almost one-third of total exports.

The Republic of Ireland is Northern Ireland's largest single market for manufactured exports, accounting for more than £1.4 billion in sales in 2014, equivalent to 23.5 percent of total exports. The rest of the EU accounted for a further 25 percent of manufactured exports, with Switzerland, Germany and France the largest markets. More than half of Northern Ireland's manufacturing exports are destined for markets outside the EU. North America is the largest non-EU export market, accounting for over £1.1 billion of sales, with Asia also a significant destination.

Fig. 27. Northern Ireland's largest export markets, 2014.

Rank	Export market	£m	% of total
1	ROI	1,414	23.5%
2	North America	1,158	19.2%
3	Switzerland	859	14.3%
4	Germany	400	6.6%
5	France	371	6.2%
6	Asia	367	6.1%
7	Netherlands	265	4.4%
8	Middle East	193	3.2%
9	Africa	153	2.5%
10	Australia	112	1.9%
11	Russia	94	1.6%
12	Belgium	80	1.3%
13	Italy	79	1.3%
14	Central and South America	72	1.2%
15	Spain	63	1.0%

Source: DETINI

The mix of destinations and increasing globalisation of trade is important given the range of expected rates of growth across the globe. Ireland is expected to grow significantly faster than the world average over the next decade, and should provide strong demand for Northern Ireland's exports. Above average growth is also forecast for Asia, the Middle East and Africa that collectively account for 12 percent of Northern Ireland's manufactured exports. Growth in these markets will be an important source of demand, as we expect US and European GDP growth to be slower than the world average. Nonetheless, the size of these markets means they will continue to be an important driver of Northern Ireland's manufacturing sector.

An added issue with exports are exchange rate movements. A rise in the value of sterling—all other things being equal—makes domestic exports more expensive and can have a detrimental impact on the ability of domestic firms to win contracts in foreign markets. In addition, large fluctuations in the exchange rate make it harder for manufacturers to plan ahead due to increased uncertainty about future volatility. Over the last 10 years sterling has seen large movements relative to the Euro; falling in value by almost 25 percent between 2005 and 2009; while strengthening in value by 17 percent over 2014 and 2015.

Exchange rate movements and volatility does not have a uniform impact across all types of manufacturing, with exporter of basic products or commodities (such as food, basic metals) more likely to see the largest impact.[18] Indeed, significant movements in exchange rates were in the top 5 challenges for manufactures in the 2015 EEF Aldermore Executive Survey 2015.[19]

3.2 Research And Development

Research and development (R&D) makes a difference to economic productivity in a number of ways: by improving the quality of goods, by reducing the costs of producing existing goods and by increasing the range of goods or intermediate inputs available.[20] In an increasingly competitive market R&D is essential for the product development and innovation that will help drive demand for goods produced in Northern Ireland.

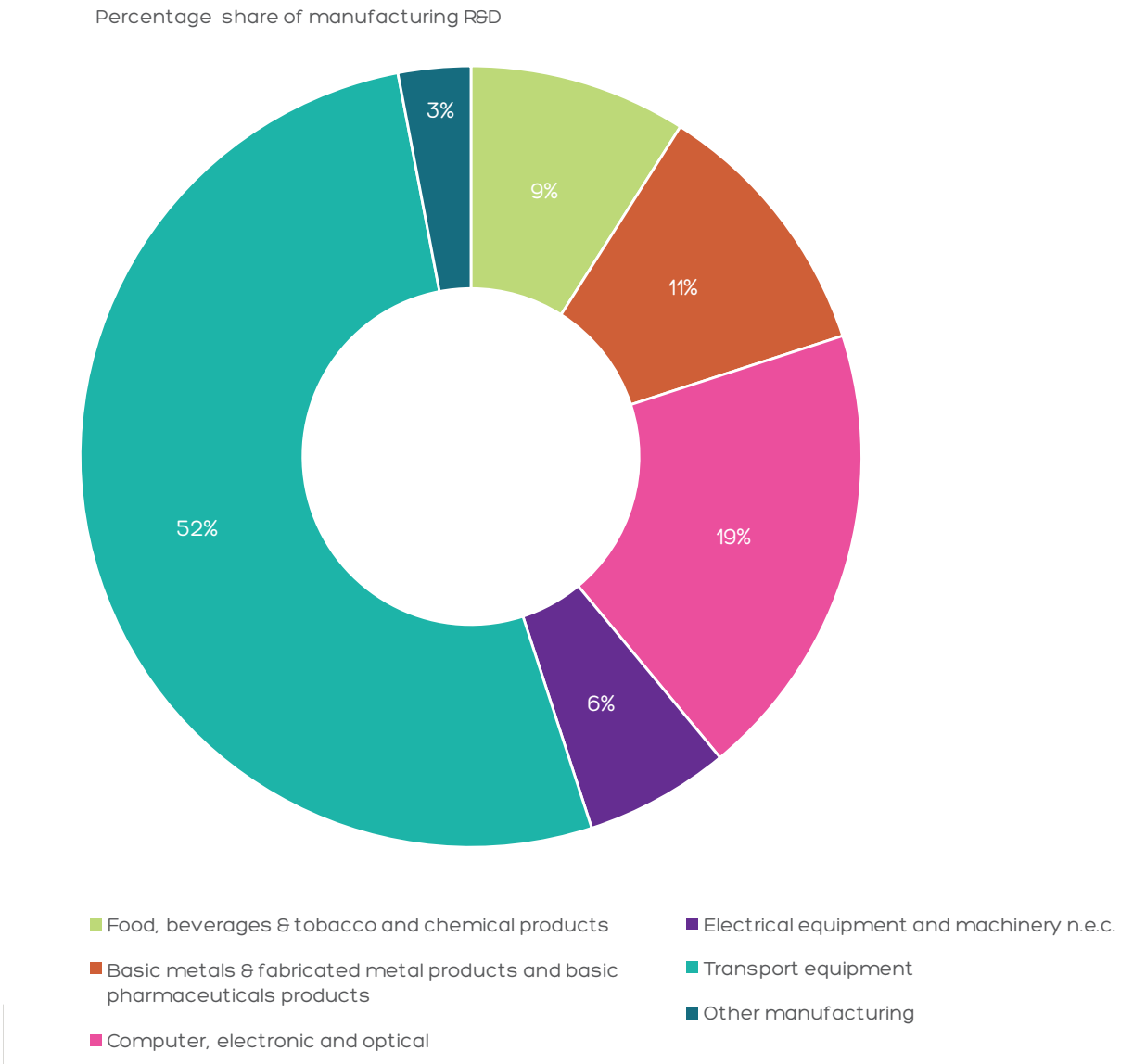
Furthermore, R&D carried out in one company can have positive spill-overs to other firms or industries as the benefits accrue to competitors, other firms, suppliers and customers. These benefits tend to be greatest for firms in close vicinity and in this way, R&D advances Northern Ireland's competitive edge and technological frontier, helping to deliver greater economic output.[21] Academic evidence suggests that the private rate of return for R&D is around 25

18 EEF, *The exchange rate: why it is, and isn't, an issue for UK manufacturing* (2015)
19 EEF Aldermore, *Executive Survey 2015* ,(2015)
20 Bronwyn Hall, Jacques Mairesse and Pierre Mohnen, *Measuring the returns to R&D - Working paper series (15622)* (Cambridge, MA: National Bureau of Economic Research, 2009).
21 Oxford Economics, E*conometric analysis of R&D spill-overs by sector* (2006). Value chain benefits occur when a supplier produces a better product allowing customers to make efficiency gains and hence raise their value added. These are paid for through the market. Spill-overs occur when companies become aware of and so emulate one another's innovations. These are not paid for. Proximity typically makes them easier to achieve. See 'Knowledge spill-overs and sources of knowledge in the manufacturing sector' Future of manufacturing project evidence paper 18 Government office for Science 2013.

percent, but that the total social rate of return is almost three times higher at 70 percent.[22]

The manufacturing sector drives R&D spending in Northern Ireland. In 2014, total manufacturing R&D expenditure was £254m, accounting for 63 percent of total business R&D expenditure. Within manufacturing, transport equipment accounted for the largest share of expenditure, with 53 percent of the sector's total R&D spend. With total manufacturing sales of £18.1 billion in 2014, the sector's R&D spend was equivalent to 1.4 percent of sales, higher than the relative spend of services and other sectors at 1.2 percent, but lower than the UK average of 3.6 percent for manufacturing in the UK as a whole.

Fig. 28. Manufacturing R&D expenditure by sub-sector, 2014



Source: DETINI

22 DTI, *DTI Strategy - The analysis - Economics paper 5:* (2003)

3.3 Foreign Direct Investment

Foreign direct investment (FDI) is also considered to be a driver of economic growth, at both the company and economy level, and as such is fiercely sought after and competed for by firms. FDI benefits the economy as it boosts overall investment when domestic investment is weak, but in addition, investors often bring advanced market knowledge and access to advanced technologies that will boost the domestic sector. The literature shows both that FDI is often export-focused and that it enables existing firms to raise their levels of productivity through innovation and investment, for instance, externally owned firms accounted for 75 percent of total manufacturing R&D expenditure in 2014. During 2014/15 Northern Ireland was the chosen location for 48 FDI projects. Despite a relative small number of investments, these projects, on average, created the highest number of new jobs for any region in the UK.[23]

In the four years to 2014/15, total planned inward investment into the manufacturing sector stood at £888m—almost 50 percent of the total inward investment in Northern Ireland over the period.[24] In terms of sub-sectors, transport accounted for the largest share (27 percent) of the manufacturing total, but was closely followed by the food, drink and tobacco (26 percent), and electrical and optical equipment (21 percent) sectors.

23 UKTI, *Inward investment report 2014/15* (2015)
24 Data provided by InvestNI following a direct request.

4. MAINTAINING MANUFACTURING'S COMPETITIVENESS

4.1 Competing In A Global Market

Manufacturers in Northern Ireland operate in an ultra-competitive market. Not only do they compete against other manufacturers in the United Kingdom, Ireland and Europe, but increasingly with manufacturers from all over the world. A 2010 report by BIS highlighted that the acceleration of globalisation through improvements in global infrastructure, transport, communications, as well as the removal of tariff and non-tariff barriers had increased the ability of companies to trade, source and purchase products from all over the world. Indeed, manufacturers may now find it economically viable to break up the production process across several geographic locations.

By way of example, figure 29 shows that over the last 35 years the value of China's exports has grown rapidly at 7 percent per annum as it has expanded its reach into new markets, overtaking the United States and Germany as the world's largest exporter of goods. Other emerging economies such as South Korea, Mexico, Brazil and India have also seen their share of global trade in goods increase. Over the same time, by stark comparison, the UK has seen its pace in growth of exports almost half that of China's, falling from the sixth largest exporter of goods to tenth in the world ranking.

Fig. 29. Share of total value world exports of goods, 1980-2015

Country	1980	1985	1990	1995	2000	2005	2010	2015
China	6.4%	4.0%	3.0%	2.7%	3.1%	6.8%	10.5%	11.6%
United States	10.2%	8.8%	9.7%	10.5%	10.6%	8.8%	9.1%	9.0%
Germany	9.6%	11.1%	9.2%	8.0%	8.5%	8.7%	8.6%	9.0%
Japan	6.3%	8.4%	6.5%	5.9%	5.4%	5.5%	5.2%	4.7%
South Korea	0.6%	0.7%	0.9%	1.3%	2.0%	2.6%	3.3%	3.6%
France	5.4%	5.7%	4.9%	4.8%	5.0%	4.4%	3.7%	3.6%
Netherlands	4.0%	4.2%	3.5%	3.6%	3.8%	3.6%	3.4%	3.4%
Italy	5.0%	5.4%	4.7%	5.1%	4.3%	3.6%	3.1%	3.0%
Canada	4.2%	5.0%	4.1%	4.6%	4.8%	3.8%	2.8%	2.8%
United Kingdom	5.0%	5.3%	4.4%	4.3%	4.0%	3.4%	3.0%	2.8%
Mexico	0.2%	0.3%	0.4%	0.8%	1.3%	1.5%	1.8%	2.4%
Spain	0.2%	0.3%	0.4%	0.7%	1.1%	1.3%	1.5%	1.9%
India	0.1%	0.1%	0.1%	0.3%	0.4%	0.8%	1.4%	1.7%
Brazil	0.2%	0.3%	0.3%	0.5%	0.6%	1.1%	1.2%	1.3%
Indonesia	-	0.2%	0.2%	0.4%	0.5%	0.7%	1.0%	1.2%

Source: Oxford Economics

The nature of the competition faced by Northern Ireland's manufacturers is also changing. Manufacturers in emerging economies initially captured market share on a cost basis, but they are now rapidly moving up the value chain in terms of producing higher value activities and industries.[25] This intensification of competition in the market means the sector in Northern Ireland must compete on both a cost and quality basis in order to remain competitive on an international scale.

Globalisation also, of course, brings opportunities for Northern Ireland's manufacturing sector. Rising incomes in developing economies over the next few decades will shift the demand increasingly towards the kinds of high-value products that manufacturers in Northern Ireland tend to produce. In addition, as emerging economies grow, their own demand for intermediate products is likely to grow—therefore placing more demand on the global supply chain and enhancing the potential customer base for Northern Ireland's manufacturers.[26] As discussed in section three, Northern Ireland is already well established in international markets, and has strong growth potential if it is able to remain competitive on both quality and cost terms.

4.2 Competing On Price

To a large extent, competition is all about cost. For any business the key to long-term success is being able to bring a quality product to the market but at a competitive price. Manufacturers in Northern Ireland, like their competitors across the globe, need to control costs, but also invest and create innovative processes and products.

Manufacturing is a high turnover, high cost sector—with large outlays in employment, capital and general materials (that include energy and transport costs). Manufacturers are sensitive to rising costs in any of these areas, which hit profit margins and threaten the long-term viability of the sector.

Investment decisions are usually taken over the long term as firms recycle their profits into capital investment or R&D enabling them to purchase new equipment or create new and innovative processes and products, and with the dual aim of both improving the quality of products but also, by increasing the productivity of the business, helping to keep long-term costs down.

There is an obvious link between existing and expected costs and the capacity of a firm to invest. Any increase in costs will act to squeeze profits, affecting rates of return from long-term investments, and consequently sharp and unexpected cost shocks in one area may mean cutting back on another. As well as this kind of immediate cost-saving response to a changing cost base, a survey of manufacturers in Northern Ireland in 2007 found that scaling

25 BIS, *Manufacturing in the UK: an economic analysis of the sector* (2010)
26 BIS, *Manufacturing in the UK: an economic analysis of the sector* (2010)

down future plans and reducing investment or spending were among the most common responses in dealing with rising costs over a longer time period.[27]

What these survey results suggests is that any sustained period of strong cost growth, that is not in line with changes to the cost base of its competitors, risks diminishing the competitiveness of the manufacturing sector in Northern Ireland both by making its goods straightforwardly more expensive, and by reducing the capacity of the sector to make the kinds of investment that are needed to drive innovation and ultimately growth. As we have seen, given both the size of the manufacturing sector in Northern Ireland, and the ripple-down benefits that it generates in terms of output and jobs all across the economy, the impact of any decline in the sector's competitiveness can be expected to have far-reaching consequences for Northern Ireland's economy, leading to a loss of competitiveness of the sector in Northern Ireland. This will make it harder to win contracts, reduce the ability to compete in both established and new markets, and ultimately, put the jobs and incomes the sector supports at risk.

4.3 Factors Affecting Cost In Northern Ireland

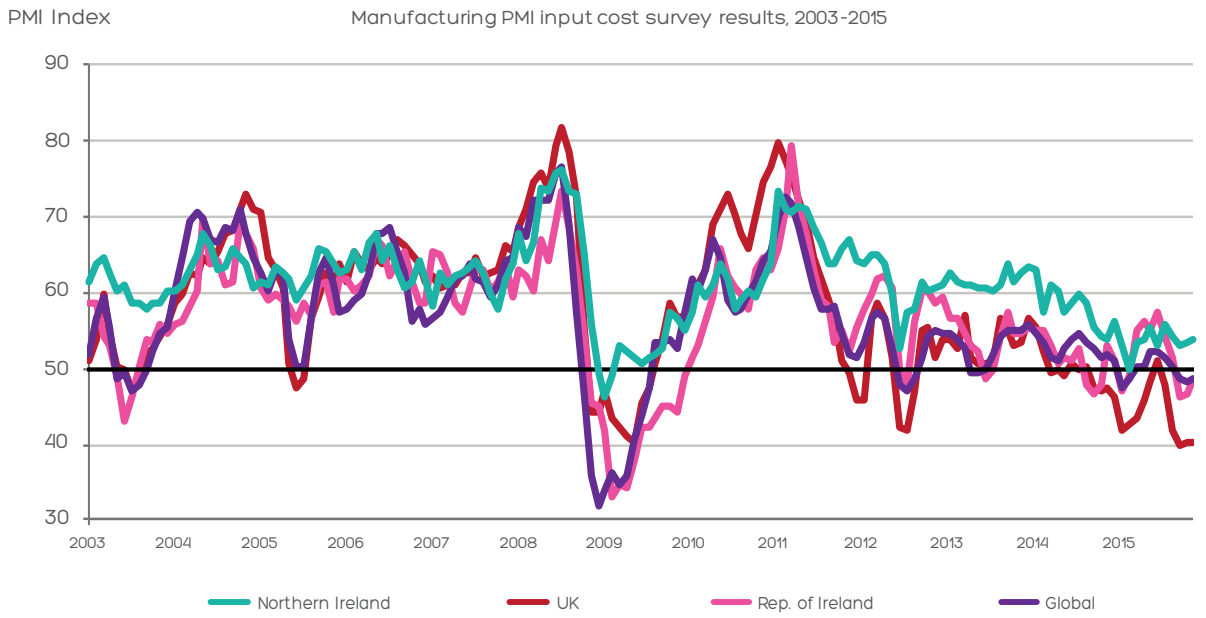
Using the monthly purchasing manager's index (PMI) survey of companies in Northern Ireland we can explore the performance of the manufacturing cost base in Northern Ireland relative to its international competitors.[28]

The survey shows that since 2011, reported input costs in manufacturing in Northern Ireland have been increasing more strongly than for manufacturers based in the UK, the Republic of Ireland and across the globe. Prior to 2011 reported input costs were increasing but generally tracked the cost growth elsewhere, including a rapid spike, crash and recovery between late 2007 and early 2011. However, throughout 2011 and 2012, input cost inflation slowed dramatically in the UK, the Republic of Ireland and across the globe, with brief periods of price deflation. In stark contrast, input cost growth in Northern Ireland remained strong, and did not start to converge to the UK, the Republic of Ireland and global pace of growth until late 2013, and then taking a year to fall into line.

The following sections explore the main costs facing Northern Ireland's manufacturers—in particular labour costs and production costs, including energy and transport—and examines how these costs have changed by comparison to the picture for its major competitors.

27 ERINI, *Review of industrial derating policy* (2007)
28 The monthly PMI survey is conducted by Ulster Bank and Markit. Companies are asked: have average input prices or input costs risen, fallen, or remained unchanged this month compared to one month ago?

Fig. 30. PMI Manufacturing input cost survey results, 2003-2015



Source: Ulster Bank, Markit

4.3.1 Labour costs

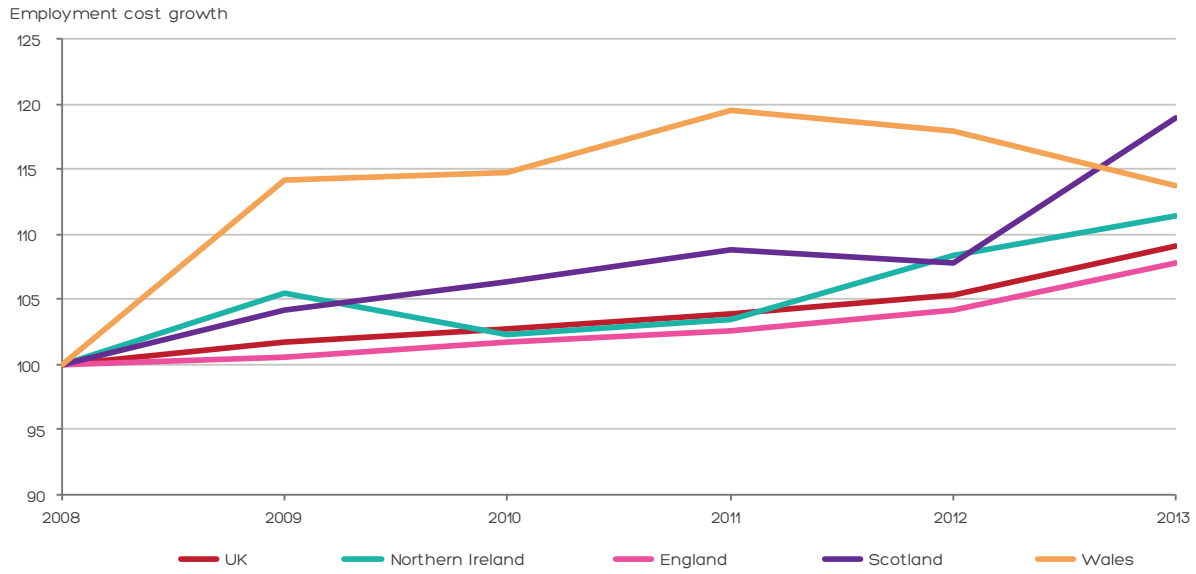
Like most other industries, and as seen in section 2.1.3, manufacturing wages in Northern Ireland are below the UK average. In 2015 the median weekly gross pay for a full-time manufacturing employee was £479, 12 percent below the UK equivalent. The picture of wage patterns is, however, changing. In 2014 annual wage growth was 6.6 percent in Northern Ireland, substantially higher than the UK average pace of growth, at just 1.6 percent on 2014. In fact, the competitive gap on wages between Northern Ireland and the UK as a whole has been reducing for some time. Since 2008, wages for full-time employees have risen by 16 percent in Northern Ireland, significantly faster than the UK average of 12 percent.

This is reflected when examining the average cost of employment in Northern Ireland against other countries in the UK.[29] Average employment costs in manufacturing in Northern Ireland have increased by 27 percent since 2008, significantly faster than the UK average of 17 percent and the second highest in the UK behind Scotland.

29 Total compensation of employees (CoE) by industry and region are made available by the ONS in the Regional Gross Value Added (Income Approach) reference tables http://www.ons.gov.uk/ons/rel/regional-accounts/regional-gross-value-added--income-approach-/december-2015/index.html. Cost per employee is estimated by dividing COE by jobs in the sector for each region. While the largest element of labour costs are wages paid to employees, total labour costs are also determined by the number of people employed as well as social insurance and pension costs. In 2013, total employment cost per worker in manufacturing was £38,700, 9 percent below the UK average and the lowest in the UK overall.

Having lower labour costs in absolute terms is an advantage in relation to competitors in other developed economies in the UK, the US, France, Germany and Italy. But this advantage becomes less relevant as global competition in manufacturing increases where emerging economies have a significant advantage due to low wage levels compared to developed economies. This is particularly relevant in labour intensive areas of manufacturing.[30]

Fig. 31. Employment costs per job, UK regions, 2008-2013, current prices.



Source: ONS

4.3.2 Input costs: energy and transport

Echoing the relatively strong growth in labour costs that we have outline above, an examination of Annual Business Survey (ABS) produced by the ONS confirms that Northern Ireland has also experienced stronger growth in input costs in manufacturing relative to the UK average. The survey shows that that total expenditure on goods, services and materials stood at £9.5 billion in 2013, an increase of 9.2 percent since 2008. This increase was significantly greater than the UK average of 5.1 percent, and was the second largest increase in the UK after Wales. The increase in cost was not reflected in an increase in economic activity in the sector however; as we estimate that over the same period GVA in real terms fell by 2 percent, while data from the PMI survey show that reported output activity was in line with the UK average.

Beyond expenditure on general goods, services and materials used in manufacturing production, the two major cost categories are energy and transport. We explore below how costs in these two areas have changed in recent years for Northern Ireland's manufacturers.

Energy represents a significant cost for almost all businesses, but is particularly important for an energy-intensive industry such as manufacturing. Energy costs are highly dependent on oil and gas prices, and as such energy costs are among the most volatile. Surveys conducted

30 McKinsey & Company, *Manufacturing the future: The next era of global growth and innovation* (2012)

by the Northern Ireland Chamber of commerce show that energy costs are a major concern for businesses in Northern Ireland. Over 60 percent of businesses cited energy costs as the most burdensome on business, with a significant proportion reporting that they felt energy costs were a potential deterrent to future investment decisions.[31]

In 2013 total expenditure by the sector on energy and water was £250m, a decrease of almost 16 percent since 2008. These costs accounted for 2.6 percent of the sector's overall expenditure on purchases. Over the same period equivalent costs in the UK as a whole fell by just 1 percent. However, energy costs in Northern Ireland are much more erratic, and prone to sharp fluctuations in comparison to the UK as a whole. For instance, costs in Northern Ireland increased by 31 percent in 2012 only to fall by 10 percent the following year. As we explored above, sharp and unexpected cost shocks can have the effect of discouraging investment and encouraging businesses instead to cut back on spending in the interests of stability.

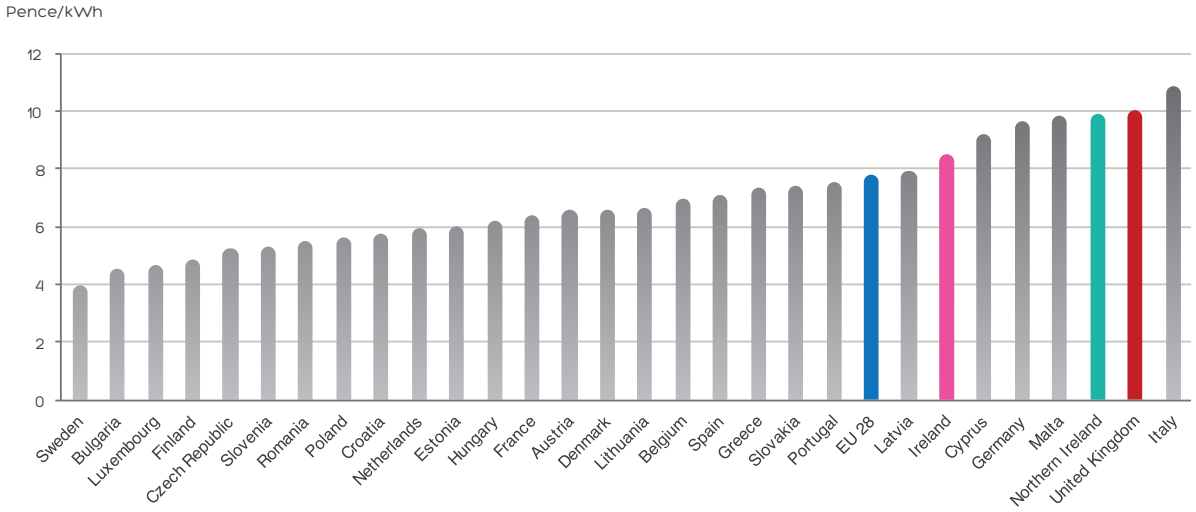
Importantly, although comparable to costs in the UK, within energy costs consumption of electricity is a major component, and non-domestic electricity unit rates in Northern Ireland are close to being the most expensive in Europe. In particular, large unit cost differentials with the Republic of Ireland are regarded as a particular threat to the competitiveness of manufacturing in Northern Ireland.[32] Medium-sized industrial and commercial (I&C) consumers of electricity in Northern Ireland face slightly higher unit costs compared to equivalent consumers in the UK as a whole (figure 32), but face unit costs over 26 percent higher than equivalent European consumers and over 16 percent higher than in the Republic of Ireland.[33] The unit rate differentials even greater for large I&C consumers, with the unit rate over 18 percent above equivalent users in the Republic of Ireland and over 58 percent above the EU median.[34]

The price of gas is also an important factor in determining energy costs in Northern Ireland, not least because it is an important input into the generation of electricity. Therefore higher wholesale gas prices push up the price of electricity that businesses face, as well as the retail cost for I&C customers that use gas for general industrial purposes.

Gas prices in Northern Ireland have been higher than the UK as a whole due to a lack of competition and the fact that the gas supply largely comes from Great Britain.[35] We estimate that the average unit cost of Gas for a typical industrial and commercial user is the second highest in the EU, 35 percent higher than the equivalent cost in the UK and 47 percent higher than the cost in Ireland.

31 Northern Ireland Chamber of Commerce and Industry with BDO: *Quarterly Economic Survey 2014 Quarter 4 results* (2015)
32 View expressed by Manufacturing Northern Ireland in client meeting.
33 Consistent with the Utility Regulator, industrial and commercial users that consume between 2,000-19,999 MWh per annum are considered medium sized users. Consumption greater than 20,000 MWh are considered large and very large users. Note that EU states unit costs have been converted from EURO to GBP using the average exchange rate for Q3 and Q4 2015. Comparing rates NI and UK rates against Euro members will be affected by fluctuations in the exchange rate. Unit rates reported exclude VAT and other recoverable taxes and levies.
34 Utility Regulator, *Retail Market Monitoring Quarterly Transparency Report Q3 July-September 2015* (2015)
35 ERINI, *Review of industrial derating policy* (2007)

Fig. 32. Medium sized industrial and commercial electricity unit costs, EU 28 and Northern Ireland, H2 2015.



Source: Utility Regulator NI, Eurostat, Oxford Economics

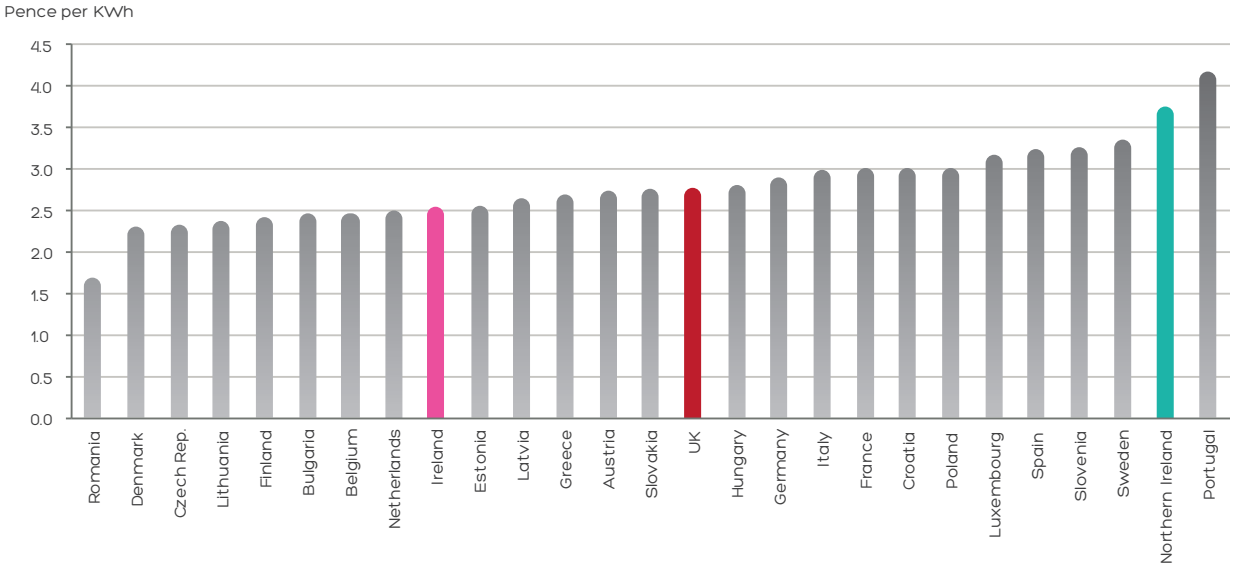
Transport and logistic costs are also significant for most manufacturers but the peripheral location from the other countries in the UK means manufacturers based there face additional haulage costs in moving raw materials and finished products to and from ports in Great Britain, as well as the freight costs in transporting supplies and products across the Irish sea.

This means firms in Northern Ireland face a set of additional costs when dealing with the domestic market. In fact, some face a double hit if both their supply chain and final market is based in GB. These are costs that competitors based in Great Britain to not have to incur, and therefore place firms in Northern Ireland at a distinct disadvantage in this area.

After labour and materials, purchase of road haulage is the highest expense for manufactures in Northern Ireland, with total expenditure reaching £252m in 2013, accounting for 2.6 percent of total intermediate costs. This was slightly higher than the equivalent cost for manufacturing in the UK as a whole. Similar to energy costs, total road transport costs are around the same level as they were in 2008, but are much more volatile in Northern Ireland relative to the UK, with the movement of costs marked by sharp movements particularly in 2009, 2012 and 2013. This is in contrast to the relatively smooth downward trend of total costs in the sector for the UK as a whole.

A key driver of transport costs is the price of petrol and diesel. In November 2015 petrol and diesel prices in Northern Ireland were competitive with the rest of the UK. Although there is little variation in price across the UK as Northern Ireland's price comes just under the UK average. However, compared to other European Countries, fuel prices in the Northern Ireland are significantly higher, placing manufacturers in Northern Ireland at a distinct cost disadvantage.

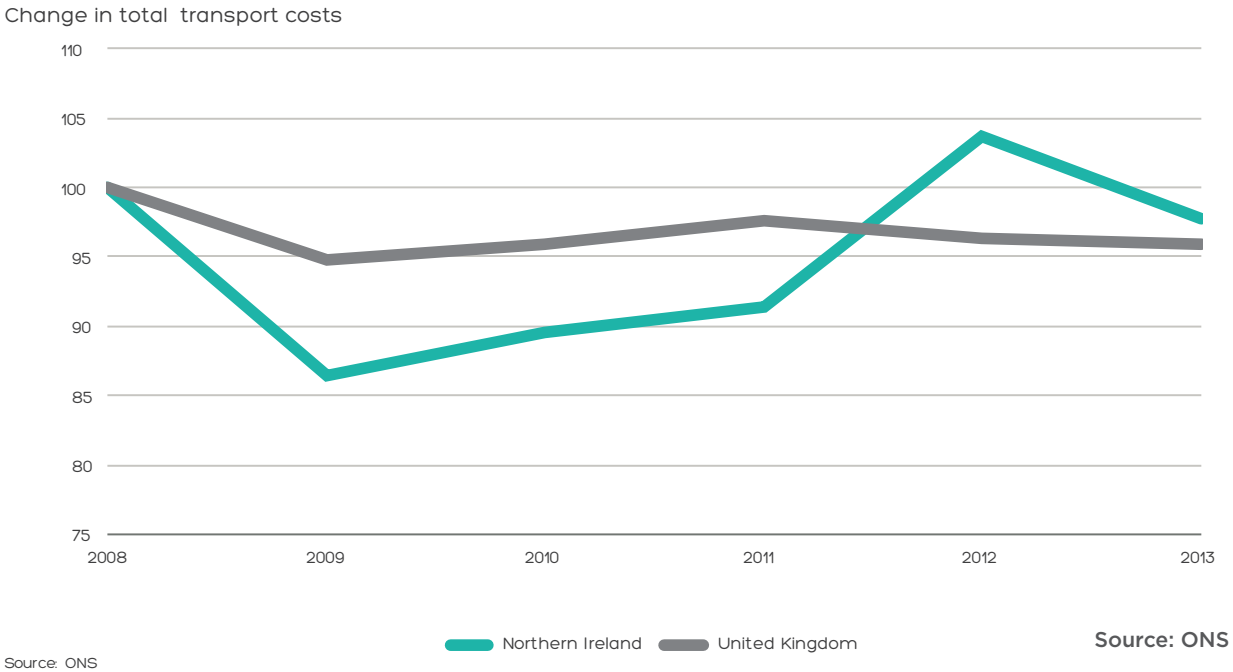
Fig. 33. Industrial gas prices in the EU for small consumers, ex Vat, H1 2015



Source: Decc, Firmus Energy
Data not available for Malta or Cyprus

The high cost of fuel in the UK is driven by very high rates of taxation on petrol and diesel, which account for 71 percent and 69 percent of the pump price, respectively. This is significantly higher than the median rates of taxation in the EU15, where per litre of petrol and diesel is 65 percent and 58 percent, respectively. The taxes are likely to have more impact on manufacturers in Northern Ireland as they face additional freight costs in moving goods around the United Kingdom.

Fig. 34. Change in total transport costs, 2008-2013



Source: ONS

Source: ONS

4.3.3 Business rates and industrial de-rating

A whole range of other factors, of course, also affect costs for manufacturers: including taxes that are levied, and that can vary markedly across different countries, impacting on the cost base and therefore competitiveness.

Business rates are a tax on commercial property and are regarded as a tax on production in the national accounts. They are set independently of the value of the goods or services produced by the business and are levied on businesses whether or not they are profitable.

Business rates in Northern Ireland are the lowest in the UK by a significant margin. This means that the amount of tax paid on a property in Northern Ireland will be significantly less than the amount paid on a property of the same value anywhere else in the UK. In addition, de-rating means that qualifying premises pay only 30 percent of the fixed business rate, dramatically cutting the business rate liability for manufacturing firms in Northern Ireland. However, it should be noted that while England, Scotland and Wales do not have a similar concession on business rates, there other forms of support such as Enterprise Zones.

To date there are 24 enterprise zones across England, 15 in Scotland and 7 in Wales, but none in Northern Ireland. Benefits to businesses based within enterprise zones can include; up to 100 percent discount on business rates up to £275,000 over a 5 year period; 100 percent tax relief on capital investments; simplified planning; and funding for improved infrastructure.[36] In May 2015, Finance Minister Arlene Foster announced a full review of Business Rates in Northern Ireland and Manufacturing Northern Ireland expressed an interest in understanding the contribution of the sector to the economy as well as the implications of a potential rate rise on the sector. While it is beyond the scope of the project to complete a detailed impact analysis of how substantial the implementation of full rates would affect the industry, we have been able to run a very high-level analysis of potential impact using the published regional national accounts for Northern Ireland.[37]

This analysis assumes that any changes to de-rating will affect profit levels in manufacturing firms, and that this will, in turn, impact of the extent of their investment, innovation, and competitiveness.

The Northern Ireland executive stated in its consultation that industrial de-rating costs the exchequer £58 million per year.[38] Our assumption is that its removal would lead to a direct increase in total taxes on production by an equivalent amount. Industrial de-rating would therefore put pressure on the cost base and profitability of firms throughout the sector. It is important to stress that the additional tax liability will vary by firm size, with manufacturers operating in larger premises likely to face an increased tax liability in the magnitude of hundreds

36 HM Government, *About Enterprise Zones* http://enterprisezones.communities.gov.uk/about-enterprise-zones/ [accessed February 2016]
37 ONS: *UK non-financial business economy, (annual business survey)*, 2013 regional results (2015)
38 DFPNI: Review of Northern Ireland's non-domestic rating system (2015)

of thousands of pounds. Section 2 discussed that large firm's account for half of total employment and turnover in Northern Ireland (see figure 6). Therefore, if the additional costs were to put excessive pressure on margins it could pose a significant risk to employment within large firms and the amount of money they put through the supply chain; damaging the sector as a whole. While smaller firms will face a smaller liability in absolute terms, the impact would also be significant, especially given the important role these firms in supporting the small towns and rural communities.[39]

Northern Ireland already has the fastest growing business rates in the UK, and has seen an increase of 13 percent since 2008/09, compared to average growth of just 3 percent across the other countries in the UK. Even if implementation of full rates was phased in over a number of years, it would lead to a significant increase in the business rates liability of manufacturing firms in Northern Ireland of 70 percent.

We also assume that the additional liability would be distributed amongst manufacturing's sub-sectors according to the number of firms within the sub-sector. As such, the two largest sub-sectors—other manufacturing, and repair and basic metals and metal products industries—with 25 percent and 22 percent of total manufacturing firms each, would be subject additional taxation on production worth £14.7 and £12.5 million respectively.

Figure 36 shows the high-level sectoral impact of de-rating on profits. Overall, the manufacturing sector would see profits fall by £58 million, or just under 3 percent. This will increase the share of profits that is accounted for by taxes on production to just under 7 percent. The largest proportional fall in profits would be felt by the other manufacturing and repair, basic metals and metal products industries. The wood and paper products and printing industry sector would also suffer a relatively large drop in profits, as would the coke and refined petroleum products industry.

Fig. 35. Business rate poundage multiplier, UK countries, pence

Country	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
England	46.2	48.5	41.4	43.3	45.8	47.1	48.2
Wales	46.6	48.9	40.9	42.8	45.2	46.4	47.3
Scotland	45.8	48.1	40.7	42.6	45.0	46.2	47.1
NI	29.9	29.9	30.7	31.5	32.2	33.0	33.9
De-rating effective poundage	8.9	8.9	9.2	9.4	9.6	9.9	10.1

Source: Valuations Office Agency; Scottish Parliament Information Centre, DFPNI

39 The ERINI study finds that the rate to profit proportion for smaller firms was twice that of larger firms, though due to sample size the authors advise caution about the results. ERINI, Review of industrial derating policy (2007)

METHODOLOGY: ESTIMATING PROFITS IN MANUFACTURING

Business rates are treated as an overhead that is incurred if businesses produce output. To assess the high-level impact of any changes to de-rating policy, we assume that businesses within each sector will absorb the increased fixed overhead through profits rather than reducing employment costs (though wages, employment, or both). We do not assume that manufacturers will pass on the overhead via price due to the strong level of competition in the market.

We therefore need to make an estimate of profit levels in manufacturing firms. Following the method outlined by ERINI (2007) we use gross operating surplus (GOS) as a proxy measure for industrial profit.[40] Similarly, we have included mixed income into our proxy measure for profit where it is not possible to distinguish between wages and profits of sole proprietors. Our estimate of profit is, therefore, essentially the total value of production once the cost of intermediate goods and the cost of employment have been removed. Other things being equal, the impact of de-rating will lead to a reduction in gross operating surplus and mixed incomes, which we classify as profit.

We further assume that businesses use their profits in a number of ways: to pay taxes, repay creditors and pay rent on capital. Beyond these costs, profits are used to fund the kind of investments that help to retain and boost competitiveness, for example replacing out-dated equipment or funding R&D.

How keenly de-rating will impact on manufacturing's profitability and therefore investment will be, in part, a function of the scale of profits in different sub-sectors. How strongly this affects economic output and jobs will be related to the scale of impact, in particular in those more sizeable manufacturing sub-sectors. In 2013 manufacturing as a whole earned a profit of just under £2 billion with total taxation on production coming to £75 million, accounting for just 4 percent of total profit. Figure 38 shows that the food products, beverages, and tobacco industry had by far the largest profit of all manufacturing sub-sectors in Northern Ireland. The sub-sectors with the largest number of firms in 2013 were the other manufacturing & repair, and basic metals & metal products industries with 1,025 and 870 firms, respectively. These both had mid-ranging profits of around £100 million with combined taxation on production of £18 million.[41]

There is large variation across the sub-sectors in terms of taxes on production with no clear correlation between the levels of profit generated. In fact, the coke & refined petroleum products industry pays more in taxation on production than basic pharmaceutical products and preparations. As such the share of profits accounted for by taxation on production is also highly variable with basic metals & metal products with the highest share of profits, followed by wood & paper products and printing.

40 ERINI, *Review of industrial derating policy* (2007)
41 Profit as defined here is the sum of the GOS and mixed income for each sub-sector published in Regional Gross Value Added reference tables. Taxes on production are as published by the ONS.

Fig. 36. Estimated impact of industrial derating on manufacturing, 2013[42]

Industry	Profit (£m)	Change	Tax as a % of profit
Food products, beverages & tobacco	744	-0.9%	2.1%
Transport equipment	193	-1.3%	4.4%
Rubber and plastic products	176	-1.9%	7.6%
Computer, electronic and optical products	156	-0.8%	2.8%
Basic pharmaceutical products	133	-0.2%	1.0%
Basic metals and metal products	89	-12.4%	27.7%
Machinery and equipment	87	-4.6%	14.0%
Other manufacturing and repair	81	-15.3%	25.5%
Chemicals and chemical products	81	-1.1%	7.2%
Textiles, wearing apparel and leather	70	-3.7%	6.6%
Electrical equipment	65	-1.7%	4.9%
Wood and paper products and printing	63	-10.7%	23.1%
Coke and refined petroleum products	1	-11.5%	238.9%
Manufacturing	1,938	-2.9%	6.9%

Source: ONS

Our approach assumes that all firms across all sectors would absorb the additional levels of taxation through lower profits. It is likely that some firms across different sectors and that even firms within the same sector would react differently. Indeed the assumption that firms will absorb additional costs through profit depends on each individual firm's profit margin over total cost. Although not modelled in this exercise, it is acknowledged that margins will differ greatly both across and within industries. Some may, for example, decide to absorb extra costs by reducing employment costs; others may decide to protect profits by cutting back on input costs.

Whatever the outcome, the potential impact of industrial de-rating would be likely to affect the competiveness of Northern Ireland's manufacturing sector by increasing by reducing capacity to make the kinds of investments needed to keep pace. It would be likely to negatively impact on the investment decisions of firms currently operating in Northern Ireland, as well as on incentives for potential investors from abroad.

42 Numbers may not add up due to rounding

As we have seen, this is in a context where the overall cost base in manufacturing in Northern Ireland is already rising faster than manufacturers in the UK and across the globe—driven by rising employment costs, and in a situation where the cost of purchasing intermediate goods, services and materials is rising at twice the pace as the UK as a whole.

Unless firms find other avenues to absorb the cost, this will reduce the productive capacity and competitiveness of the sector. Indeed the decision by Michelin to close its plant in Ballymena specifically cited high energy costs as a factor, while Bombardier stated that it's looking to optimise its cost base by going to lower cost countries.

In such a context any further uncertainty or threats to the cost base—including those stemming from public policy decisions—would seem likely to delay or discourage the major investment required to replace depreciating stock and the purchase of new technology that is necessary to retain sector's international position and its scope to support wider economic output. Ultimately, reduced competitiveness of the sector puts at risk the thousands of jobs and livelihoods that the manufacturing sector supports in communities across the region.

5. CONCLUSION

Manufacturing is important for Northern Ireland's economy. It employs over 85,000 people and accounts for a higher share of output relative to manufacturing in the UK as a whole. The sector also plays an integral role in supporting incomes and communities outside Belfast, as it is the largest employer in places like Mid Ulster and East Antrim, where it also accounts for over a quarter of all economic activity.

Manufacturing is also embedded into Northern Ireland's economy. With its extensive supply chains it has links with almost every other sector in the economy. In addition to the direct jobs and growth manufacturing accounts for, the sector stimulates an additional £5 billion in economic activity, supports an additional 129,000 jobs, with wages of around £2.1 billion. Therefore, when manufacturing grows, the whole economy grows with it.

Northern Ireland will experience the fastest manufacturing growth in the UK. This is supported by investment that boosts productivity. However, increased productivity means we expect to see a decline in employment in the sector over the next decade.

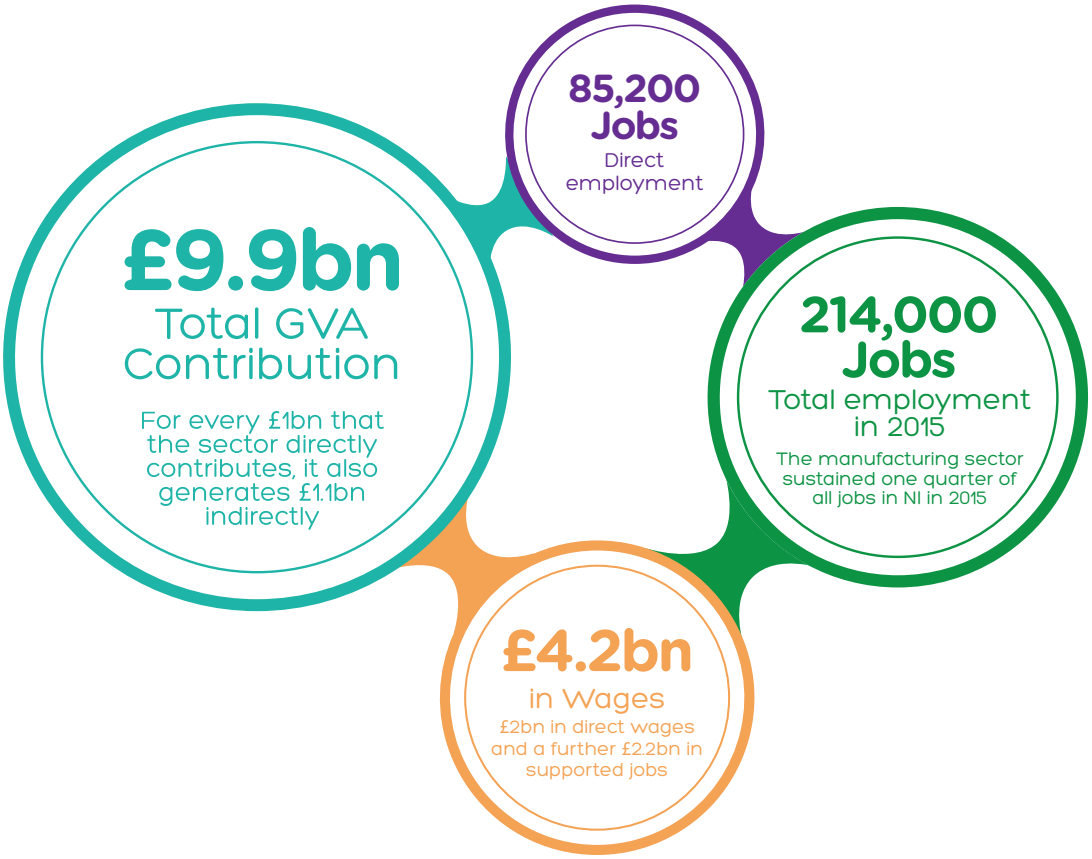
Manufacturing is the largest source of export revenue in Northern Ireland, with sales reaching £6 billion in 2014, playing an important role in keeping the economy balanced. Strong GDP growth in Northern Ireland's largest export market, the Republic of Ireland, as well as other significant markets in Asia, the Middle East and Africa will provide strong demand for export goods over the forecast period. Though weak growth in North America and Europe is a concern.

Manufacturing is the largest source of business expenditure in research and development and is a major source of FDI. Both of these are crucial in driving innovation and productivity that will keep the sector competitive.

But manufacturing faces a significant challenge in keeping its cost base in line with its competitors. Faster input costs as well as rising costs of employment has meant that costs in the sector have been rising faster than manufacturing in the UK as a whole and across the globe.

While rising cost is a concern in itself, it also reduces the capacity for the sector to invest. Reduced investment will reduce the amount of innovation and productive capacity that the sector can achieve in Northern Ireland, therefore limiting long-term growth. Any further pressure on costs, such as industrial de-rating, will intensify the challenges faced by the sector and provide a further obstacle to sustainable growth.

Manufacturing has a crucial role to play in the future performance of Northern Ireland's economy. This is reflected in our baseline forecasts as well as being explicitly articulated in wider EU growth policy. However, the sector is vulnerable to global shocks or changes in policy, which would threaten the sector's capacity to maintain its performance in line with current expectations. On the flip side, if supported, manufacturing is well placed to capture the benefits of global growth. By implementing policies that deal with the kinds of competitiveness issues highlighted by the Commission, governments can create an environment within which Northern Ireland's manufacturing sector can flourish.



6. APPENDIX

Fig. 37. Advanced manufacturing definition, SIC07 divisions

Sector name	SIC07 code
Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus	27
Manufacture of batteries and accumulators	27
Manufacture of wiring and wiring devices	27
Manufacture of electric lighting equipment	27
Manufacture of domestic appliances	27
Manufacture of other electrical equipment	27
Manufacture of chemicals and chemical products	20
Manufacture of basic pharmaceutical products and pharmaceutical preparations	21
Manufacture of computer, electronic and optical products	26
Manufacture of machinery and equipment not elsewhere classified	28
Manufacture of motor vehicles, trailers and semi-trailers	29
Manufacture of other transport equipment	30
Repair and installation of machinery and equipment	33
Engineering activities and related technical consultancy	71

Source: OECD, Oxford Economics

Fig. 38. Total Profit and Taxation on production by manufacturing sub-sector, 2013[43]

Industry	Profit (£m)	Taxes on production (£m)	Taxes as % of Profit
Food products, beverages and tobacco	725	9	1%
Transport equipment	192	6	3%
Rubber and plastic products	163	3	6%
Computer, electronic and optical products	156	4	2%
Basic pharmaceutical products and preparations	120	1	1%
Basic metals and metal products	90	12	13%
Other manufacturing and repair	80	6	8%
Machinery and equipment	80	8	10%
Chemicals and chemical products	80	5	6%
Textiles, wearing apparel and leather products	67	2	3%
Electrical equipment	60	2	3%
Wood and paper products and printing	56	7	13%
Coke and refined petroleum products	1	2	200%
Manufacturing	1,860	75	4%

Source: ONS

Fig. 39. Manufacturing employment and shares, Northern Ireland council areas, 2015[44]

	Manufacturing jobs (000s)	Total jobs (000s)	Manufacturing share of total
Antrim and Newtownabbey	7	64	11.2%
Armagh, Banbridge and Craigavon	12	85	14.3%
Belfast	11	233	4.7%
Causeway Coast and Glens	4	52	7.8%
Derry and Strabane	5	60	8.7%
Fermanagh and Omagh	5	51	10.0%
Lisburn and Castlereagh	5	64	8.4%
Mid and East Antrim	10	52	19.6%
Mid Ulster	15	63	23.8%
Newry, Mourne and Down	7	67	10.5%
North Down and Ards	3	48	6.1%
Northern Ireland	85	840	10.1%

Source: Oxford Economics

Fig. 40. Sectoral GVA multipliers, Northern Ireland

Sector	Multiplier
Electricity, gas, & steam	3.5
Agriculture, forestry and fishing	1.9
Construction	1.9
Transportation and storage	1.8
Manufacturing	1.8
Wholesale and retail trade	1.6
Accommodation and food service activities	1.6
Financial and insurance activities	1.6
Water supply; sewerage, waste management	1.6
Arts, entertainment and recreation	1.6
Professional, scientific and technical activities	1.5
Administrative and support service activities	1.5
Public administration and defence	1.5
Information and communication	1.5
Real estate activities	1.4
Human health and social work activities	1.4
Mining and quarrying	1.3
Other service activities	1.3
Education	1.1

Source: Oxford Economics, ONS, DETI
Note: They table reflects Type 1 multipliers only, which capture direct and indirect effects only. They do not include the induced effects.

44 Numbers may not add up due to rounding

7. TECHNICAL APPENDIX

Methodology and assumptions
This section describes the approach adopted to produce local estimates of the impact of the manufacturing sector in Northern Ireland. This section outlines general issues (i.e. provision of direct, indirect, induced and total estimates for GVA, employment and wages).

Available data
The major sources of employment and GVA data on the manufacturing sector were the Oxford Economics Regional Model and the Local Model of Administrative Districts (LOMAD). Employment and GVA data in each case is sourced from the ONS and DETINI, and is consistent with the 2007 Standard Industrial Classification system. Earnings data was sourced from the Annual Survey of Hours and Earnings (ASHE); which is also published by the ONS and DETINI.
Our estimates have been presented in terms of their purchasing power in a single "base" year. This base year is 2012 in all ONS National Accounts and in Oxford Economics' suite of forecast models. Prices expressed in 2012 terms are also known as "2012 prices" or "real prices".

Model framework
The first step was to estimate performance metrics (employment, GVA, gross earnings) for the manufacturing sector at a Northern Ireland regional level.
The Oxford Economics regional model contains employment and GVA data for each of the manufacturing sub-sectors at a "2-digit" level of detail. Wage data for the manufacturing sector is not available at a local authority level. We therefore used Northern Ireland level data from the ASHE. Using this data, we could calculate the contribution of the sector for Northern Ireland. That is, those directly employed in manufacturing, their earnings, and the value of output or GVA directly from manufacturing.

These metrics were split between Northern Ireland's 11 local authorities using their share of Northern Ireland's total manufacturing employment.

The value of direct output from the element was then used in conjunction with the UK input-output tables to work out the indirect or supply chain impacts.

An input-output model gives a snapshot of an economy at any point in time. The model shows the major spending flows from "final demand" (i.e. consumer spending, government spending, investment and exports to the rest of the world); intermediate spending patterns (i.e. what each sector buys from every other sector – the supply chain in other words); how much of that spending stays within the economy; and the distribution of income between employment incomes and other income (mainly profits). In essence an input-output model is a table which shows who buys what from whom in the economy.

Although input-output tables gave us an estimate of supply chain spending, they do not assign this geographically. To overcome this we again used the sectoral employment concentrations in each local authority along with the assumptions in Figure 41 to split the supply chain spending or indirect spending into that sourced locally within the local authority area, that sourced within the region and that sourced within the rest of the UK.

We have assumed that sourcing of certain activities should be treated separately. For example, for low value sectors it is likely that a business will look to those closest to it, whereas for high value sectors they will be more open to sourcing services and goods from further afield. The higher the concentration of employment in any one sector the more we assume they source locally.

For example, if an area has a location quotient (LQ) in a low value sector of below 50 we have assumed it sources 40 percent locally, 30 percent regionally and 30 percent nationally. However if it has a LQ above 50 and below 100 in a high value sector, we assume they source 30 percent locally, 30 percent regionally and 40 percent nationally.

Fig. 41. Supply chain spending assumptions

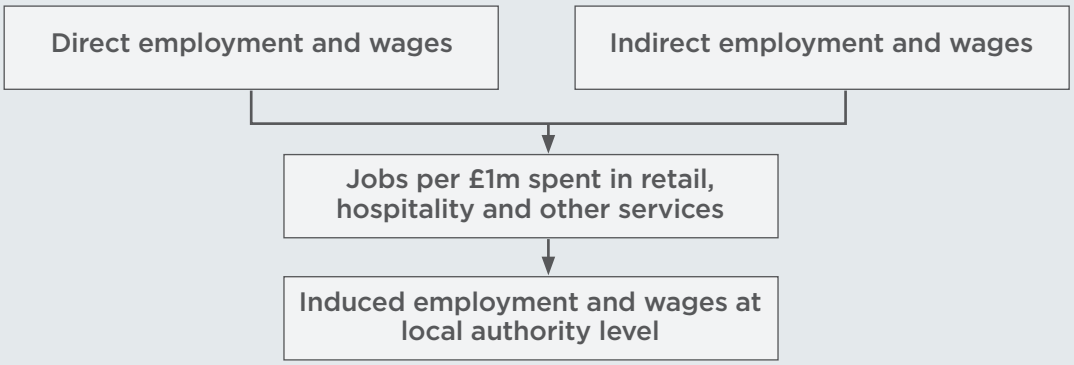
	Locally		Regional		Nationally	
LQ	Low value sectors	High value sectors	Low value sectors	High value sectors	Low value sectors	High value sectors
50	40	20	30	35	30	45
100	50	30	25	30	25	40
150	60	40	20	25	20	35
200	70	50	15	20	15	30
250	80	60	10	15	10	25
300	90	70	5	10	5	20

The supply chain spending that is allocated regionally is distributed across the local authorities based on employment concentrations.

The result is an estimate of supply chain or indirect output split by sector and local authority. After converting this to GVA, we then apply regional sectoral productivity estimates to produce indirect employment. Regional wages from ASHE are then used to produce indirect wage estimates for each local authority.

The next stage was to produce our induced employment and wage impacts (i.e. the creation of direct and indirect jobs will induce further employment creation through the spending of direct and indirect earnings). Typically, the majority of consumers' disposable income will fall into the four sectors: retail, hotels and restaurants, arts and entertainment, and other services. We therefore calculate the number of jobs found in each sector per £1 million of income. Given we have calculated direct and indirect wages; we can then estimate the number of additional induced jobs that would be expected to arise in each local authority.

Fig. 42. Model framework - estimating induced benefits



The model developed for this study provides a robust tool for estimating local benefits arising from the activity of Northern Ireland's manufacturing sector. In practice the manufacturing sector will not source goods and services based purely on regional boundaries and sectoral employment concentrations; there is likely to be a preference for proximity. Despite this, the approach adopted in the model provides a sensible approach to allocating impacts, and takes account of proximity by allocating spending to the local economy, then the regional economy.

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