

The background of the cover features a series of overlapping, semi-transparent blue waves that create a sense of movement and depth. The waves are in various shades of blue, from a deep cerulean to a light sky blue. The overall effect is a modern, abstract design.

Northern Ireland Economic Overview

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Article 1: Northern Ireland Economy: Context and Challenges

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This article begins by giving a brief assessment of the Northern Ireland economy and the context within which it continues to operate. A key element of the analysis will be to highlight that whereas there are some encouraging economic trends particularly within the labour market, the economy remains below the UK average in terms of overall economic prosperity. A number of key challenges facing the economy are then outlined for the medium / longer term. In particular, the focus of the economy needs to become more value added in order to raise the trajectory of economic growth, a factor that applies equally to the manufacturing and service sectors. Opportunity is also taken throughout to highlight and contextualise some of research that DETI is taking forward in 2006/07 to better inform its policy programme.

I. CONTEXT

As a small open economy, Northern Ireland cannot insulate itself from global economic developments. Not only is Northern Ireland facing increased competition from new competitors such as China, India and the EU Accession countries but the business cost base is rising (e.g. energy, environmental, transport & compliance costs¹). However, globalisation also presents a number of opportunities for Northern Ireland and it is essential that firms become more outward looking, taking advantage of new markets as they open and increasing the level and value of exports from Northern Ireland.

If exports are to form an increasing part of the Northern Ireland economy one would expect export growth to outpace economic growth. However, manufacturing external sales as a proportion of private sector Gross Value Added (GVA) have decreased from 78.6% in 1999/00

to 67.0% in 2004/05. Improving export performance is also linked to the level of R&D and innovative activity given that exposure to larger markets will necessarily increase the need to compete on quality. DETI is currently working with the Economic Research Institute for Northern Ireland to assess export and R&D performance in Northern Ireland and the measures that government can deploy to enable companies to become more export focused.

At the local level, the Northern Ireland economy continues to perform well against a range of economic indicators. Employment is at record levels, unemployment remains at historic lows and the latest figures show annual economic growth is above the UK average.

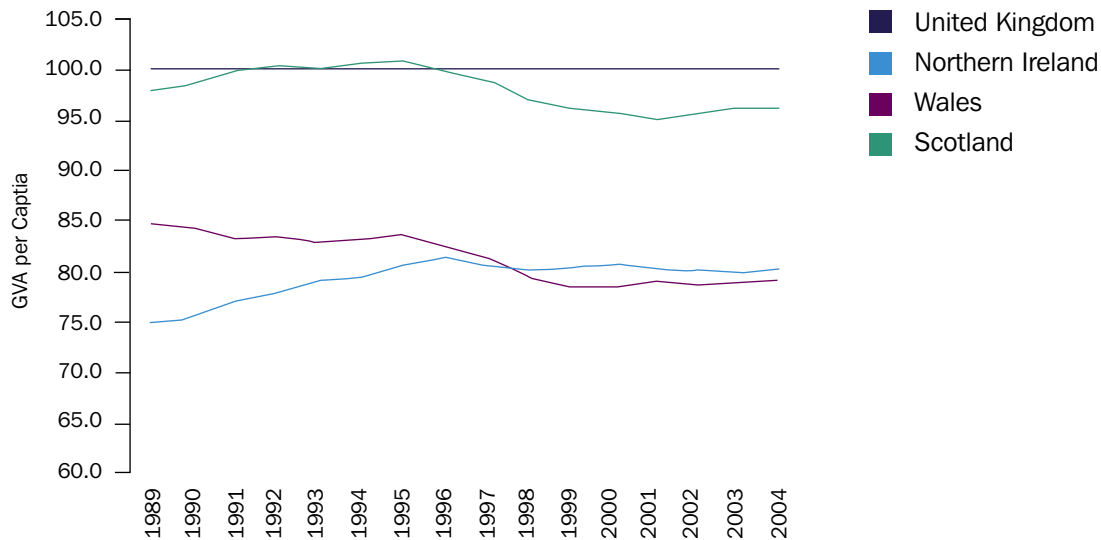
ECONOMIC GROWTH

The latest available figures show that nominal growth in the Northern Ireland economy (measured by Gross Value Added) was 5% in 2004, above the UK rate of 4.6%. Over the longer term (see Figure 1) Northern Ireland has experienced some convergence with the rest of the UK: in 2004 Northern Ireland's GVA per head was 80.2% of the UK whereas in 1989 it was 74.8%. In addition, Northern Ireland's GVA per head compares favourably with two other UK regions - Wales (79.1%) and the North East (79.9%).

Increases in service employment, particularly within business and financial services (see Article 29), have driven the improving Northern Ireland GVA performance but as Figure 1 illustrates the per capita gap with the UK remains. This gap is largely determined by the output per employee of Northern Ireland's workers (productivity); the number of people with jobs in the Northern Ireland economy (employment rate); and the size

GVA per capita (UK=100)

Figure 1



Source: ONS Regional GVA

and structure of the Northern Ireland population (demography).

PRODUCTIVITY

In the majority of the UK regions, differences in productivity represent the most important element of regional GDP per capita variations². Labour productivity is the main contributing factor (along with economic activity) to Northern Ireland’s poor GVA per head performance relative to the UK (see Article 9: The Productivity Gap in Northern Ireland and Article 2: Sectoral influences on low productivity in Northern Ireland). Northern Ireland has a poor record in terms of the main productivity drivers of enterprise, innovation and skills with the region having relatively low levels of business starts³, R&D expenditure⁴ and a high proportion of the workforce with no qualifications - discussed in greater detail later in the article.

Therefore a fundamental challenge is to address Northern Ireland’s current productivity gap with the UK. While part of the gap can be explained by the industrial mix, the majority of Northern Ireland’s sectors are less productive relative to their UK counterparts. The concentration of these low value added sectors also partly explains Northern Ireland’s low levels of R&D. A key measure here is GVA per filled job; in 2004 this was 85.8% of the UK whereas in 1998 it was 89.2%. This decrease has been partly due to the shift from manufacturing employment (where Northern Ireland has higher levels of productivity compared to the UK) to services (where Northern Ireland has a greater level of low productivity sectors relative to the UK). High employee growth in low value added sectors in Northern Ireland and an increase in part time working in Northern Ireland during the 1990’s have also contributed

to the increased productivity gap. Articles 8 (Comparing Northern Ireland Productivity) and 9 (The Productivity Gap in Northern Ireland) explore this issue in further detail.

LABOUR MARKET

Northern Ireland’s labour market has performed relatively well in recent years. The unemployment rate (4.4%) has more than halved over the last decade and now compares favourably with the corresponding UK rate (5.2%). The net increase in employee jobs in Northern Ireland over the last decade (+19.9%) also compares favourably with the UK (+12.8%).

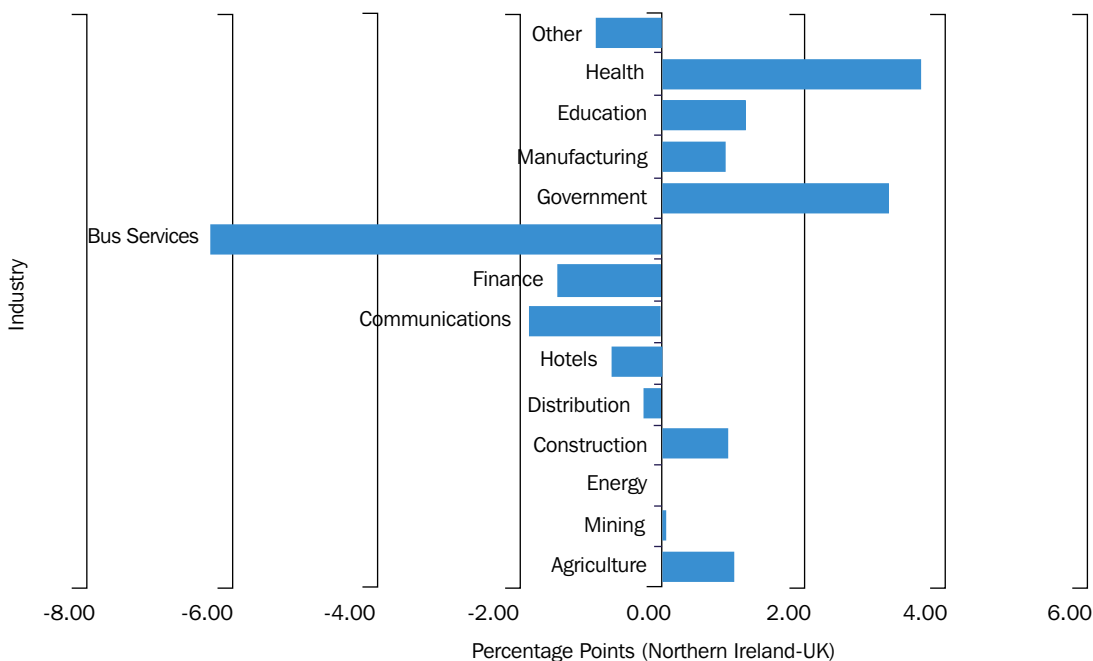
Despite this growth, Northern Ireland’s labour market has two key weaknesses - employment structure and inactivity. Figure 2 highlights that

Northern Ireland’s employment structure remains distinctly different from the UK. Notwithstanding the employment growth in Business Services, Finance & Communication, these sectors remain under-represented relative to the UK. Given that value added is greater in elements of these sectors then it is imperative that this structure continues to be addressed in the coming years. Figure 2 also illustrates the well documented point that Northern Ireland is over-represented in the Health, Education and Government sectors and we return to the significance of this later in the article.

Northern Ireland’s working age employment rate (69.3%) is the lowest among the UK regions - 5.4 percentage points below the UK average of 74.7%. This highlights that Northern Ireland’s key labour

Employment Shares in Northern Ireland, Difference from UK

Figure 2



Source: DETI & ONS - figure relate to December 2005

market weakness is the high levels of economic inactivity. In the three months to March 2006, 27.4% of the working age population in Northern Ireland were economically inactive - substantially higher than the UK (21.2%). During 2006, DETI will continue to conduct analysis into issues relating to economic inactivity and identify knowledge gaps that will further inform policy.

DEMOGRAPHY

The RoI experience has demonstrated the positive influence that favourable demographics can have on economic growth, namely an increasing working age population and large inflows of skilled migrants. The proportion of Northern Ireland’s total population of working age (61.7%) is significantly lower than the corresponding RoI figure of 68.0%. Furthermore, Northern Ireland’s

working age population is forecast to grow by 2.9% (UK = +2.3%) over the next decade (see Figure 3) which is less than half the rate of the RoI (+8.0%). The primary cause of these differential growth rates is inward migration. While the RoI will benefit from continued inward migration over the period 2006-2016, the Northern Ireland economy is projected to have more individuals leaving the province than entering. If migration was excluded, both economies would have similar rates of working age population growth - Northern Ireland (+5.1%) & RoI (+5.3%).

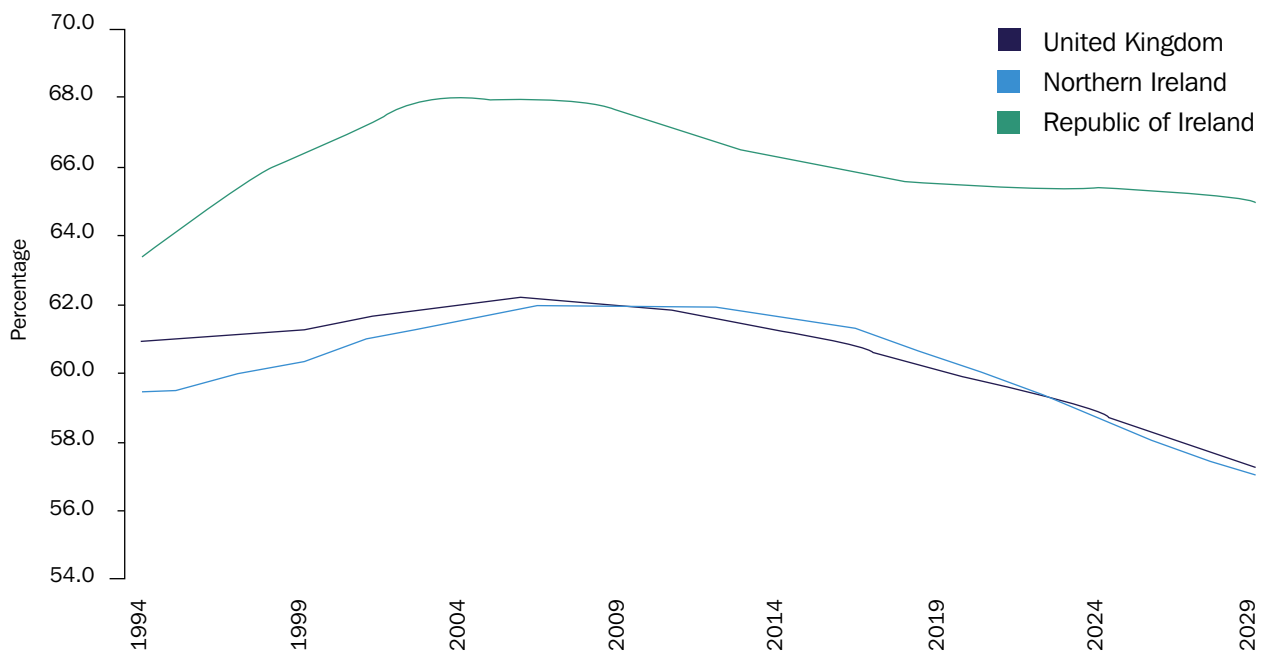
II. CHALLENGES

COMPETING SUCCESSFULLY WITHIN A SERVICE DRIVEN ECONOMY

In recent years the phenomenon of globalisation has been accompanied by increased low cost

Working Age Population as Proportion of Total Population

Figure 3



competition. As a result, advanced economies have to grow by expanding higher value added sectors within manufacturing but increasingly in the service sector (see Article 29).

Figure 2 and Article 29 highlight that Northern Ireland, relative to the UK, is under-represented in the export intensive service sectors (for example, business services). Therefore a key challenge is to address this by competing for FDI within the tradable services sector and encouraging expansion within indigenous tradable service firms.

In relation to the former, Table 1 highlights the growing importance of FDI in services relative to manufacturing for developed countries over the course of the 1990s. Much of this FDI is as a result of the relocation of labour intensive service industry functions to locations remote from the business centre. In recent years Northern Ireland has benefited from service sector FDI, such as Northbrook Technology and Citigroup, which fall within the business services sector. A current DETI research project, being taken forward in 2006, will concentrate on the impact of service sector FDI and the actions required to ensure that Northern Ireland maximises the impact of FDI in the future.

To encourage greater value added within the indigenous service sector it is important for

Table 1

Inward FDI stock in Developed Countries

	1990	2002
Manufacturing	45.3%	33.9%
Services	54.7%	66.1%

Source: World Investment Report: The Shift towards Services, UNCTAD (2004)

the current level of innovation and R&D to be increased. While this is easily understood for the manufacturing sector, where firms often have dedicated R&D spend / departments, within the service sector it is more complex. For example, a key dynamic for innovation in services centres is often interactivity with other firms as opposed to the internal capabilities of a plant or firm, as in manufacturing. Research elsewhere suggests that service sector firms innovate in a different way than their manufacturing counterparts.

Given the importance of this area, and the fact that the service sector accounts for 73% of GVA but only 32% of business expenditure on R&D, DETI is currently undertaking a research project on innovation performance in the tradable services sector. The results from the latest EU-wide Community Innovation Survey will be utilised to provide a better understanding of how service firms innovate and identify the main drivers/ barriers to innovation. The research will also examine policy support currently in place and identify gaps or weaknesses in the policy framework.

REBALANCING THE ECONOMY

Economic Vision recognises the over dependence on the public sector and highlights that strengthening the private sector is an economic imperative. Public expenditure as a percentage of GDP is significantly higher in Northern Ireland than all other UK regions. Furthermore, the latest available figures highlight that Northern Ireland’s fiscal deficit in 2003/04 is almost 30% of GVA.

With regard to lessening the role of the public sector in Northern Ireland it is important to be clear on the rationale, for some would argue that it is not inconsistent to have a simultaneously large public sector and relatively strong economic

growth. For example, countries such as Sweden and Denmark have high levels of public expenditure but also strong economic growth: average annual growth rates (1993-2003) were 3.1% and 2.6% respectively. However, it can also be argued that the smaller the size of government then the greater the scope for the private sector to grow. The challenge is threefold.

- Public expenditure needs to be allocated, where possible, to those areas giving the greatest return and this is particularly important in the current fiscal framework where public expenditure growth is increasingly constrained.
- Further consideration needs to be given to where (and how) government activities can transfer to the more productive, wealth creating private sector.
- The private sector (as illustrated in Figure 2) needs to improve in structure and as a consequence, remuneration, in order to prevent skilled labour being further absorbed by the public sector where median earnings are around 44% greater (see Article 18). The scale of this challenge is further outlined in Table 2 which compares the public and private sectors in Northern Ireland in terms of gender and educational attainment.

The table illustrates that the public sector, on average, is better educated with over one third having a degree or equivalent which is markedly higher than in the private sector (12.3%). This, however, is not radically different than the pattern for the UK as a whole where 33.7% of persons employed in the public sector have a degree compared to 17.4% in the private sector. At the other end of the qualification spectrum, the private sector in Northern Ireland has a higher proportion of persons employed with no qualifications (20.0%) - compared to 11.7% in the public sector. Although this is not patently different than the pattern elsewhere in the UK the absolute figures are much lower: 10.6% and 5.5% in the private and public sectors respectively.

Table 2 may also be applied to partly explain why the level of entrepreneurial activity in Northern Ireland is lower than elsewhere in the UK. For example, the Global Entrepreneurship Monitor (GEM, 2004) reports that females are less than a third as likely to be entrepreneurs as males in Northern Ireland. The level of female entrepreneurship in Northern Ireland is the lowest of all the UK regions (see Article 15) and the gap between male and female entrepreneurship is one of the widest. It is also noted within GEM

Table 2

Profile of Employment by Gender, Sector & Qualifications

HIGHEST QUALIFICATION	PRIVATE SECTOR			PUBLIC SECTOR		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
Degree or Equivalent	11.4%	13.8%	12.3%	37.8%	30.7%	33.8%
GCE A Level or Equivalent	36.3%	21.0%	30.8%	22.0%	13.6%	16.7%
No Qualifications	21.2%	17.9%	20.0%	12.2%	10.7%	11.7%

Source: Autumn 2005 Labour Force Survey

that Northern Ireland has one of the lowest levels of entrepreneurial activity of all UK regions in the high income group. Supply side factors such as skills go some way toward explaining lower levels of entrepreneurial activity, but the industrial structure is again a contributing factor.

Therefore, given the characteristics outlined in Table 2 and the public sector wage premium referred to earlier, there is a clear need to better assess the impact of the public sector on Northern Ireland's poor entrepreneurial activity. This is another key research priority for DETI in 2006/07 when we will examine the factors which influence Northern Ireland's 'entrepreneurial culture'.

INCREASING NORTHERN IRELAND'S SUPPLY OF SKILLED LABOUR

Figure 3 highlighted that Northern Ireland's working age population is projected to grow marginally above the UK over the next decade but by significantly less than the RoI. Nonetheless it is encouraging to note that the proportion of Northern Ireland's population under 15 years of age is 22.1% and this compares favourably with both the UK (19.3%) and the RoI (20.8%).

Given this demographic context, if Northern Ireland is to maximise its economic growth potential in terms of increasing labour supply it must encourage more people of working age into work. This will require a major effort in reducing the number of economically inactive and, as the proportion of people with no qualifications is highest within the inactive group, this is inextricably linked with enhancing skills levels (see Article 22). Furthermore, almost one quarter (22.7%) of Northern Ireland's working age population have no qualifications (Autumn 2005),

which compares unfavourably with both the RoI (17.5%)⁵ and the UK (13.4%).

Northern Ireland can also increase its labour supply by looking outside the current Northern Ireland labour market. Firstly, by retaining its graduates and secondly by attracting back those Northern Ireland students who chose to study outside of Northern Ireland. In 2003/04, almost a quarter (24%) of Northern Ireland undergraduates and one third of Northern Ireland postgraduates took up their first activity outside of Northern Ireland. The increased provision of more higher education places is assisting with this goal, however, it also highlights the need to have the demand for highly skilled private sector employment to retain and attract these individuals. In a similar vein, Northern Ireland companies could explore recruiting skilled labour from outside the UK to address specific skills shortages. The RoI benefited greatly from skilled migrant labour and it is noted that the non-Irish born proportion of the population increased from 5.4% in 1994 to 9.4% in 2003⁶. While there is anecdotal evidence about the increasing number of migrants within the Northern Ireland economy, this is an area that requires more robust analysis.

Creating these employment opportunities requires enhancing the current skills base - including management skills⁷ - particularly within indigenous firms but also in terms of the wider economy in general. A highly skilled workforce is essential in attracting high value-added FDI. Forfas, for example, noted in 2001 that foreign-owned enterprises rank appropriate skill levels as the RoI's most important advantage, followed by the favourable corporation tax rate and then by the English-language environment. Ensuring that

individuals have the right skills relevant to future employment opportunities is one of the drivers to achieve the Economic Vision for Northern Ireland and implementation of the Skills Strategy (see Article 22) for Northern Ireland is the main vehicle through which this will be delivered.

CONCLUSION

In the context of an increasingly competitive global economy, this article has sought to highlight the importance for the Northern Ireland economy to compete on quality and value added. The desired increase in export intensity requires greater emphasis on R&D / innovation and employment growth needs to come from those sectors that have high export potential. The article also highlighted some of the challenges facing the economy, particularly in terms of competing in a service-driven economy, where fewer resources (financial and human) are absorbed by the public sector and where the burden of growth is shared by indigenous and non-indigenous companies. The article has also sought to illustrate the continued commitment that Government has toward evidence based research where policy is informed by relevant up-to-date analysis as part of the DETI research agenda.

¹ Business Cost Competiveness Report, ERINI (December 2005).

² Productivity in the UK: 3 - the Regional Dimension – HM Treasury, November 2001.

³ In 2004 VAT registrations per 10,000 resident adults in Northern Ireland (31) were less than the UK (38).

⁴ Business Expenditure as a proportion of Value Added was 0.5% in 2004 compared to 1.3% for the UK.

⁵ R&I data refers to 2003.

⁶ Education, Demographics and the Irish Economic Miracle - Bank of England Quarterly Bulletin 2 (2005).

⁷ Managerial skills is a research priority for 2006/07, whereby DETI, in conjunction with DEL, will scope a project to identify and quantify areas/sectors where management skills shortages occur in NI relative to other regional labour markets.

Article 2: Sectoral influences on low productivity in Northern Ireland

Graham Gudgin, Neil Gibson, Andrew Webb- Regional Forecasts Ltd

INTRODUCTION

Northern Ireland has been a considerable success story in generating jobs and reducing unemployment. Indeed it has the best job creation record of any UK region over the last quarter century, a record of success that well precedes cease-fires or political agreements. What has been less successful has been in raising wages or productivity up to the UK average. Per capita GVA, the most widely accepted measure of economic success, has become stuck at 80% of the UK average, with little prospect of improvement in future. Average wage levels have drifted further and further behind the UK average in recent years.

Although per capita GVA is influenced by such things as employment rates, average hours worked and dependency ratios, a very important influence is the level of productivity. It is in this respect that Northern Ireland has performed least well. Northern Ireland has the lowest level of productivity of any UK region and has lagged much further behind the UK average over the last decade. It is in this area that we believe most attention to policy is needed.

Some care needs to be taken in defining productivity. In this article we define productivity as GVA per employed person¹. This is the sum of wages, profits and rents earned in production of goods and services, divided by the number of employees and self-employed people directly involved in that production. This is not the same as physical efficiency, defined as total production divided by those in employment, in the sense of tons of beef produced per farmer, or numbers of houses produced per construction worker.

GVA per employed person is influenced by physical efficiency, but also by the level of prices or the

cost of bought-in materials. For instance, GVA per employed person could be low in Northern Ireland even if physical efficiency is as high as elsewhere. If wages were reduced by high unemployment (rather than by low productivity) and companies set their prices using a fixed mark-up on costs, then GVA per employed person would be low. Similarly, profits and hence GVA might be reduced in Northern Ireland if companies have to bear additional costs, of transport to external markets or energy, without being able to pass these costs on in higher prices.

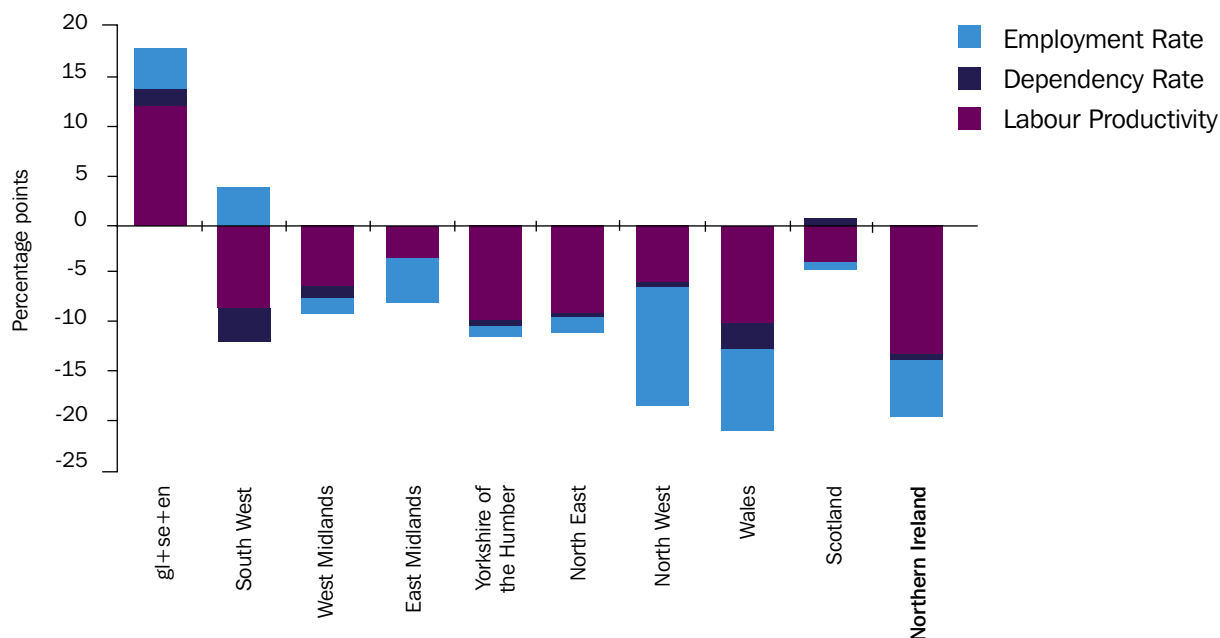
There are thus a number of reasons why GVA per employed person might be lower in Northern Ireland than in the rest of the UK, but few of these can account for the fact that Northern Ireland has been falling further behind the UK average in recent years². As a start to identifying other explanations for low productivity we follow an approach developed by McKinseys, the international management consultancy company, and examine GVA per employed person on a sector by sector basis, and suggest reasons why productivity should be low in key sectors.

PER CAPITA GVA AND PRODUCTIVITY

Within the UK the main contrast in per capita GVA is between the regions of south-east England, where GVA is high, and the remaining UK regions where it is low in every case. This contrast is mirrored by productivity, but it is obvious from Figure 1 that productivity varies much less between regions than does per capita GVA. In general, per capita GVA is lowest in regions with the lowest productivity, but the correspondence is not exact. Northern Ireland, for instance, has the lowest productivity level of any UK region but is only 3rd lowest for per capita GVA. One of the largest anomalies is the South West of England

Components of Per Capita GVA, Difference from UK Average, 2004

Figure 1



Source: Regional Accounts, ABI, LFS, ONS

Notes: Each column represents per capita GVA, and is divided into three components. Productivity is defined as GVA divided by the number of employees and self-employed people; the employment rate is the number of employees and self-employed people as a proportion of the population of working age; and the dependency rate is the ratio of non-working age people to total population. All variables are expressed as differences from the UK average.

where productivity is almost as low as in Northern Ireland, but per capita GVA is much higher.

Figure 1 shows how productivity and per capita GVA are connected across regions and is based on the following identity³:

$$\text{Per Capita GVA} = \text{GVA per employed person} + \text{Employment Rate} + \text{Dependency Rate}$$

For most regions employment rates are high where productivity is high and low where productivity is low. This suggests that high productivity regions are sufficiently competitive to generate enough jobs for most people who wish to work. Conversely, regions with low productivity tend

to have insufficient jobs to employ everyone.

They also tend to have low wages, and this may allow firms to employ more people in low productivity jobs in sectors like retailing, hotels or restaurants⁴. However, the evidence is that the number of additional low productivity jobs generated in this way is not sufficient to equalise employment rates across regions.

Northern Ireland is typical of several peripheral regions in combining low productivity with a low employment rate (Figure 1). A generally good record in creating jobs in recent years has meant that Northern Ireland's employment rate is not as low as that in Wales or North East England. The failure to generate enough jobs is what has led the latter two regions to fall below Northern Ireland in

per capita GVA even though their productivity is a little higher. The anomaly in the South West is due to a combination of low productivity with a high employment rate. The large tourism sector in the South West depresses productivity but has helped to provide large numbers of jobs.

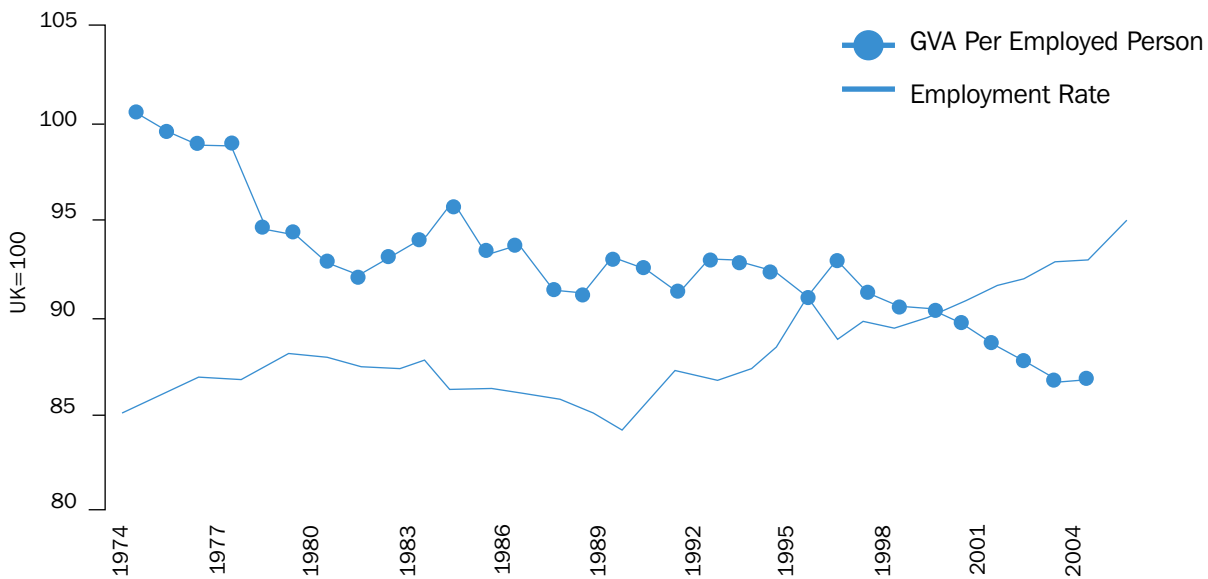
Productivity in Northern Ireland has been falling further behind the UK average for three decades at an average rate of a third of a percentage point each year (Figure 2). In the early 1970's productivity was recorded as being close to the UK average, but by 2004 it had fallen to 87% of the UK average. In fact, decline has been concentrated in two main periods. One was in the late 1970's. The other has been since 1997. Through much of the 1980's and early 1990's there was a reasonable degree of stability, with productivity in Northern Ireland at around 92% of the UK average.

While relative productivity has been falling since 1997, the level of per capita GVA has remained steady at around 80% of the UK average. This stability has been maintained because the employment rate has risen steadily, while relative productivity has fallen. Indeed, the employment rate has risen relative to the UK average since 1989. The reasons were initially the avoidance of national recession in the early 1990's, followed by post cease-fire gains in retail and call-centre employment. There is evidence that rising employment has been associated with declines in productivity relative to the UK average. This in turn suggests that many of the new jobs created during Northern Ireland's boom years for employment have been in low productivity sectors or occupations.

The trend for productivity to fall behind the UK

Productivity (GVA per Employed Person) and Employment Rate in Northern Ireland (UK =100)

Figure 2



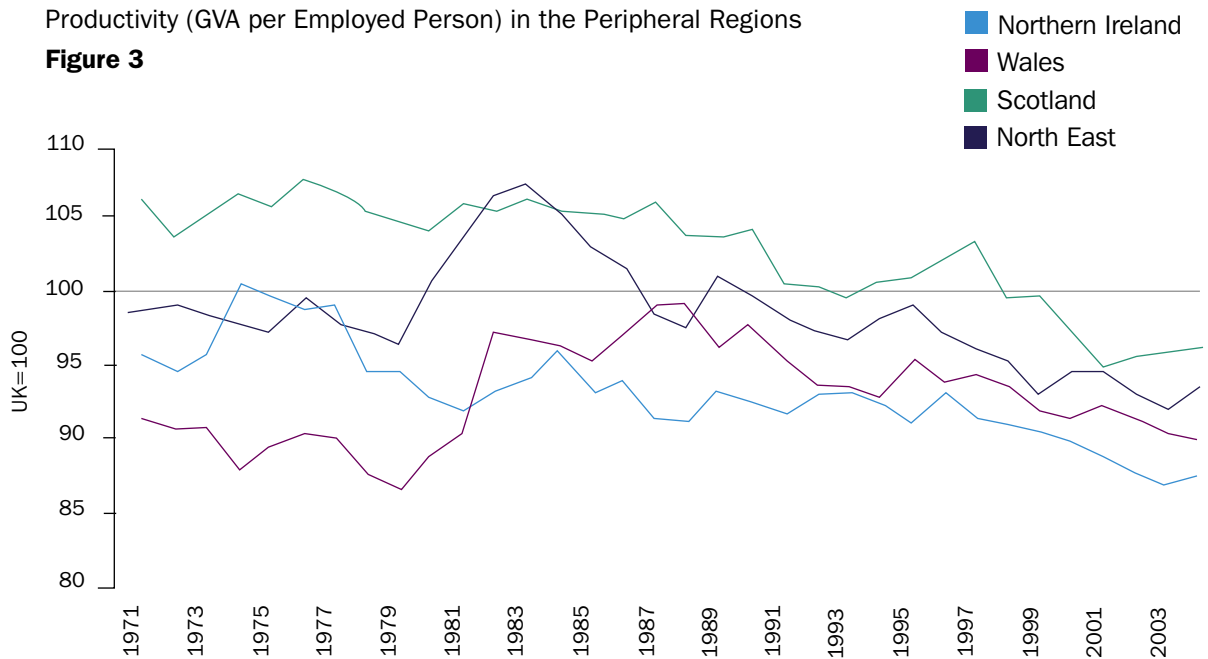
Source: Regional Accounts 2005, Quarterly Employment Surveys, LFS

average ⁵ (as regions in south east England have forged ahead) has been mirrored in other peripheral regions (Figure 3). Productivity in both Wales and the North East was boosted in the early 1980's as loss making steel sectors were closed down or 'rationalised', but since then the general trend in all peripheral regions has been one of decline in relative productivity. Scotland has had the best productivity record among peripheral regions, and GVA per employed person has only fallen below the UK average in the last few years. Even here, though, there is an unmistakable downward trend.

A SECTORAL APPROACH TO UNDERSTANDING PRODUCTIVITY

The McKinsey approach to understanding national differences in productivity described by Lewis

(2004) is based on the insight that aggregate productivity is merely the sum of productivity in individual sectors ⁶. Since most employment in advanced economies is now in the service sectors, it is these sectors that are particularly important in generating disparities between countries. Most countries have some sectors which have high productivity by international standards and some where it is low. Japan for instance has very high productivity in its electronics sectors, but low productivity in many service sectors. Japan is not alone in this respect, and in many countries productivity in the service sectors is held down by a series of regulations. In the UK for instance productivity in the retail sector is well below US levels. In McKinsey's view a major reason for lower productivity in the UK was planning regulations and difficulties in finding



Source: Regional Accounts, ABI, LFS

sites for large supermarkets and warehouses. (Incidentally, the relative ease in finding such sites in Northern Ireland since planning regulations were tightened in GB in 1995 is said to be a factor in the high level of investment by national retailers in recent years).

To adapt the McKinsey approach to Northern Ireland, we have first compared GVA per employed person in each sector with the equivalent figure for the UK as a whole (Table 1). Overall productivity in Northern Ireland was 87.9% of the UK average in 2003. Productivity was also lower in every sector except for three. One of these was the energy and water sector, including electricity where higher prices in Northern Ireland connected with the cost of privatisation appear to leak into higher wages and profits. The second is public administration where high police pay, and a high proportion of senior civil service posts, inflate average pay, and hence GVA, in this sector. The third is other services, which is dominated by recreational, cultural and sports activities, but also includes voluntary organisations and waste management. Significant parts of this sector are publicly funded and it shares the tendency for GVA to be close to UK levels in the public sector. Productivity was lowest relative to the UK average in agriculture, construction, finance and business services. We should note that the manufacturing sector, which has been the object of intense government aid over many years, now has a productivity level quite close to the UK average.

The overall gap in productivity between Northern Ireland and the UK average reflects the differences within individual sectors, shown in Table 1. It also reflects the importance of individual sectors. The high level of relative GVA per employed person in the energy and water sector, for instance, has little impact on the total

because this sector employs less than half of one percent of those working in Northern Ireland. Larger sectors generally have productivity levels below the UK average.

We need to take into account both the size of each sector and the relative productivity in that sector in order to assess which sector contribute most to low aggregate productivity in Northern Ireland. To begin this process we have first undertaken a so-called 'shift-share' analysis in which the overall difference in productivity between Northern Ireland and the UK average is disaggregated into two components ⁷, i.e.:

- A Sectoral Effect - due to the mix of sectors (i.e. is the Northern Ireland economy dominated by sectors that have low productivity where-ever they are located)
- A Productivity Effect - due to differences Productivity (GVA per Employed person) in 2003

Table 1

	£000's	UK=100
Agriculture etc	15.2	65.3
Mining & Quarrying	49	99.9
Manufacturing	36.5	95.9
Energy & Water	147.7	114.7
Construction	23.9	81.5
Distribution	20.9	90
Hotels & restaurants	15	95
Transport & Communications	37.9	93.7
Finance	46.3	86.1
Business Services	27.7	80.6
Public Administration	31.5	111.8
Education	24.2	99.2
Health	18.3	91.7
Other Services	28	102.9
Total	26.2	87.9

Source: Regional Accounts 2005, ABI, ONS

Note: GVA data in each NI and UK sector is adjusted for the 'Adjustment for Financial Services'. Total GVA excludes the ownership of dwellings

in productivity between Northern Ireland and the UK within individual sectors

The results, presented in Table 2, show that of the overall productivity gap between Northern Ireland and the UK of 12.1%:

- 5.0% was due to the mix of sectors (i.e. 'expected' productivity in Northern Ireland minus the UK average)
- 7.1% was due to differences within individual sectors (i.e. actual minus 'expected' productivity in Northern Ireland)

In addition to these two components of sectoral productivity is a technical adjustment made to the GVA figures that affects total GVA per employed person. This is an imputed value for the ownership of dwellings. Home owners are assumed to rent their houses to themselves in order that owner occupied houses can be treated in the same way as rented houses and included with GVA. The inclusion of owner occupied dwellings increases the gap in overall GVA per employed person

GVA per Employed Person in 2003

Table 2

	£000's	UK=100
Actual Productivity in NI	26.2	87.9
Actual productivity in UK	29.8	100.0
Difference in Productivity NI-UK	-3.6	-12.1
Expected Productivity in NI	28.3	95.0
Actual minus Expected in NI	-2.1	-7.1
Expected NI minus UK Average	-1.5	-5.0
Ownership of dwellings (OD)	-0.8	-2.5
Total Difference incl. OD	4.4	-13.7

Source: Regional Forecasts calculations (available on request)

Note: 'Expected Productivity in Northern Ireland' is calculated as the aggregate productivity level that would result if every sector in Northern Ireland had the same productivity as the UK average

between Northern Ireland and the UK average.

This is because imputed rents are based on the value of houses and because house prices are lower in Northern Ireland. This adjustment is left out of most of the calculations for productivity in this article, because it is not part of production in the usually accepted sense. (Nor, is it a realistic indicator of living standards since houses are generally of similar quality in Northern Ireland to elsewhere in the UK. It is the land that is cheaper).

The results in Table 2 mean that Northern Ireland's mix of industries has an important influence on the low aggregate level of productivity, but more important is that fact that productivity in Northern Ireland tends to be below the UK average in most individual sectors. By far the largest contribution to the negative sectoral effect is made by the business services sector, which is a high productivity sector nationally that is strongly under-represented in Northern Ireland⁸. Other large negative contributions were financial services, and transport and communications, both of which are under-represented in Northern Ireland and both of which have higher than average productivity at national level.

The impact of individual sectors on the 'productivity effect' is shown in Table 3. This is the impact of productivity shortfalls in individual sectors on the aggregate productivity gap between Northern Ireland and the UK average. Four sectors contribute over 80% of the 'productivity effect'. In order of importance these are:

- Business services
- Construction
- Distribution
- Agriculture, forestry, fishing

Actual minus Expected GVA per Employed Person,
Northern Ireland 2003

Table 3

	£000's	% OF TOTAL UK GVA
Agriculture etc	-0.4	-1.2
Mining & Quarrying	0	0
Manufacturing	-0.2	-0.7
Energy & Water	0.1	0.2
Construction	-0.5	-1.5
Distribution	-0.4	-1.3
Hotels & restaurants	0	-0.1
Transport & Communications	-0.1	-0.4
Finance	-0.2	-0.6
Business Services	-0.6	-1.9
Public Administration	0.3	1
Education	0	-0.1
Health	-0.2	-0.8
Other Services	0	0.1
Total	-2.1	-7.1

Source: Regional Forecasts calculations (available on request)

Because the business services sector is strongly under-represented in Northern Ireland, as well as having a much lower level of productivity than in the UK as a whole, it has by far the largest impact on Northern Ireland's low aggregate productivity. If the business services sector were as large proportionately as in the UK as a whole, and also had a UK average level of productivity, Northern Ireland's overall productivity shortfall of 12.1% would be reduced to 8.6%.

CONCLUSIONS

Northern Ireland's low productivity is due largely to low productivity in four sectors. These are business services, construction, agriculture and distribution. In each case the sectors are

dominated by small firms, and a failure to generate larger units (through farm amalgamation, business mergers or the growth of key firms) appears to have played an important role in low productivity. In addition, the under-representation of several high productivity service sectors in Northern Ireland (transport and communications, finance and business services) further undermines overall productivity. This all seems to suggest the need for much greater priority to be given by policy to a range of service sectors, instead of the past focus which has been largely on manufacturing.

The McKinsey study points to differences in regulation as a prime cause of national differences in productivity. Regulation also hinders job creation. High minimum wages in France, for example, are said to prevent low wage jobs being created in such businesses as supermarkets in the way that they would be in the USA or UK. Much regulation in Northern Ireland is national rather than regional and not easily changed. Northern Ireland gains from being part of a relatively lightly regulated economy by EU standards, and this has helped in Northern Ireland's good record of job creation and low unemployment. Other regulations are now mainly made at EU level, especially environmental and agricultural regulations. Some regulations, especially in physical planning are made within Northern Ireland. As already noted the greater ease for supermarkets in obtaining large sites has attracted firms to Northern Ireland since regulations were tightened in GB in 1995. For many years job creation has necessarily been the main focus of economic policy in Northern Ireland. This should change, since current job creation now leads to rapid immigration from Eastern Europe and elsewhere rather than further

reducing unemployment. Problems of low wages, underpinned by low productivity, needs to be the new policy priority. As a start, research should be undertaken to better understand why productivity should be so low in business services, construction, agriculture and distribution, and why some private services sectors with nationally high productivity are under-represented in Northern Ireland.

¹ The definition of productivity used is GVA divided by the total of employees in employment (from the quarterly employment survey each year) and the number of self-employed people (from the LFS) but exclude Government supported training schemes and the armed forces. As a result, the figures quoted may differ from other productivity Articles (Articles 8 and 9) due to the methodology used.

² The end of national wage bargaining in the 1980's brought to an end a system under which wages varied less across UK regions than they do now. We would have expected the consequences of local wage bargaining to have worked themselves out by the early 1990's and not to be responsible for more recent declines in relative wages and hence GVA per employee.

³ The full identity also includes interaction effects between the three components. These are generally small and have been omitted from Figure 1. This is described more fully in a feature article written by Regional Forecasts Ltd for DETI and the Economic Development Forum in 2004.

⁴ Note however that some high wage areas, including London (or New York) generate large numbers of jobs in low productivity occupations including nannies or doormen.

⁵ A regression of percentage changes in relative productivity in Northern Ireland (Y) on percentage changes in employment in Northern Ireland (X) gives the following equation. $Y = 0.61 - 0.63 * X$ ($R^2 = 0.4$). This indicates that a 1% increase in employment has been associated with a 0.6% decline in relative productivity. The equation was fitted over the period 1982-2004.

⁶ W.W. Lewis (2004) *The Power of Productivity. Wealth, Poverty and the Threat to Global Stability*. University of Chicago Press.

⁷ The equation for the disaggregation is as follows:

$$P_{ni} - P_{uk} = \sum ((E_i / E) * (P_{ni} - P_{uk})) + \sum (E_i^{ni} - E_i^{uk}) * P_{uk}$$

Where:

P=GVA per employed person

E=number of people employed or self-employed

Subscript i indicates individual sectors.

⁸ If the business services sector were proportionately as large in Northern Ireland as in the UK as a whole this would add 1.5 percentage points to Northern Ireland's level of relative productivity. The positive impact of a larger business services sector would be larger except that other sectors become proportionately smaller if business services becomes larger.

Article 3: Structure and Growth

James Gillan - Statistics Research Branch - Department of Enterprise, Trade and Investment

INTRODUCTION

This article considers Northern Ireland's recent economic performance relative to the UK regions and identifies those sectors which have shown the largest gains and losses in terms of output and net changes in jobs in the period 2001 - 2005. Economic growth during the early part of this period until 2004 was below the UK average and the article looks at how this was reflected in growth in salaries and profits. Achieving high paying profitable jobs is a desirable outcome for Northern Ireland, but there is some evidence that the rate of growth in employment costs outstripped growth in profits and this issue is further considered at sectoral level.

RECENT WHOLE ECONOMY PERFORMANCE

NORTHERN IRELAND VS UK

Northern Ireland can still claim to be the fastest improving UK region when its GVA growth is measured relative to its position in 1989. The value of incomes in the economy was some £23 billion in 2004 (Table 1). While in recent years we are no longer the fastest growing region, average annual growth over the last 5 years (5.0%) was close to that of the UK (5.1%) as a whole. Performance over this period included below average growth in the period 2000-2003 and it is only in 2003-04 that Northern Ireland has returned to an annual growth rate (5.0%) that is above the UK average (4.6%). Northern Ireland is now ranked joint sixth in terms of growth rates across the UK regions, though little separates the top six regions.

¹ Headline Gross Value Added (GVA) £m at current basic prices by region 1994 to 2004

Table 1

	1994 (10 YR)	1999 (5YR)	2000	2001	2002	2003	2004
UK (excl Extra Regio)	595 930	785 039	819 495	862 214	910 210	961 461	1005 373
North East	22 337	27 005	27 965	29 343	30 801	32 518	34 188
North West	64 044	80 613	83 567	87 914	92 163	97 096	101 996
Yorkshire & the Humber	45 491	58 363	60 535	63 732	67 456	71 553	75 219
East Midlands	39 479	50 879	52 864	55 828	58 908	62 434	65 770
West Midlands	50 192	64 796	67 357	70 556	73 960	77 797	81 745
East of England	57 805	77 106	81 459	86 179	90 721	95 906	100 307
London	92 515	127 923	133 552	140 366	150 655	159 442	164 961
South East	87 886	123 850	130 430	137 423	144 253	151 814	158 187
South West	45 195	60 795	63 713	67 335	71 095	75 086	78 650
Wales	24 748	30 473	31 735	33 512	35 277	37 359	39 243
Scotland	52 807	65 160	67 399	70 210	74 095	78 504	82 050
Northern Ireland	13 431	18 077	18 918	19 817	20 825	21 952	23 058

When those sectors comprised mainly of private sector activity are considered it can be seen that up to 2000 Northern Ireland growth rates consistently exceeded those of the UK (Figure 1). Since then, growth in these sectors, with the exception of construction, has tended to track the trend in the UK. In contrast, growth in those sectors comprised mainly of public sector activity has been declining relative to the UK and this has been more marked over the last 5 years. Given the

continuing over dependence on the public sector, this is not in itself undesirable but may have had an impact on the private sector. That said, in the period 1999-2003 the rate of growth in exports also slowed noticeably relative to previous years. While a slowdown in public sector growth and exports may explain part of the below average growth of the Northern Ireland economy relative to the UK, it also raises questions about what other factors may have been operating.

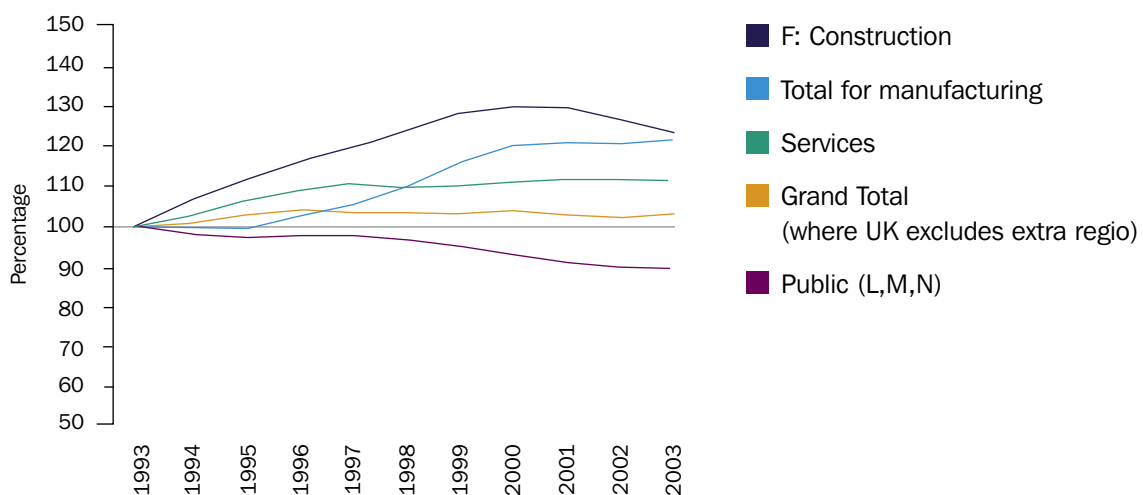
Ranked Headline Annual Gross Value Added (GVA) growth at current basic prices by region 1994 to 2004

Table 2

ANNUAL GVA GROWTH (RANK IN BRACKETS)	1993 - 1994	1998 - 1999	1999 - 2000	2000 - 2001	2001- 2002	2002- 2003	2003- 2004
UK (excl Extra Regio)	5.6%	4.6%	4.4%	5.2%	5.6%	5.6%	4.6%
Northern Ireland	6.4% (1)	4.6% (5)	4.7% (4)	4.8% (10)	5.1% (8)	5.4%(=9.5)	5.0% (6)

Northern Ireland GVA Index as % of UK GVA index (1993 = 100)

Figure 1



Source: ONS, DETI Statistics Research Branch

Focusing on changes in headline GVA only tells part of the story. Regional Accounts information allows the disaggregation of GVA into the income that accrues to employees and the self employed in wages and salaries (Compensation of Employees) and the surplus arising after accounting for salaries and the cost of goods and services (Gross Operating Surplus) with the latter accounting for some 38% of GVA in 2003.

A key outcome for Northern Ireland government in promoting economic development is to encourage the growth of well paying private sector jobs delivering high value added goods and services to the rest of the world. Given that full-time private sector salaries² in Northern Ireland are currently some 82% of those in Great Britain it is clear that there is still considerable room to develop the kind of high paying private sector jobs needed to close this gap. It can be argued that growing the value of wages and salaries is therefore a desirable objective in that it makes a significant contribution to the value of regional income. However, it is clear such payments also represent an important

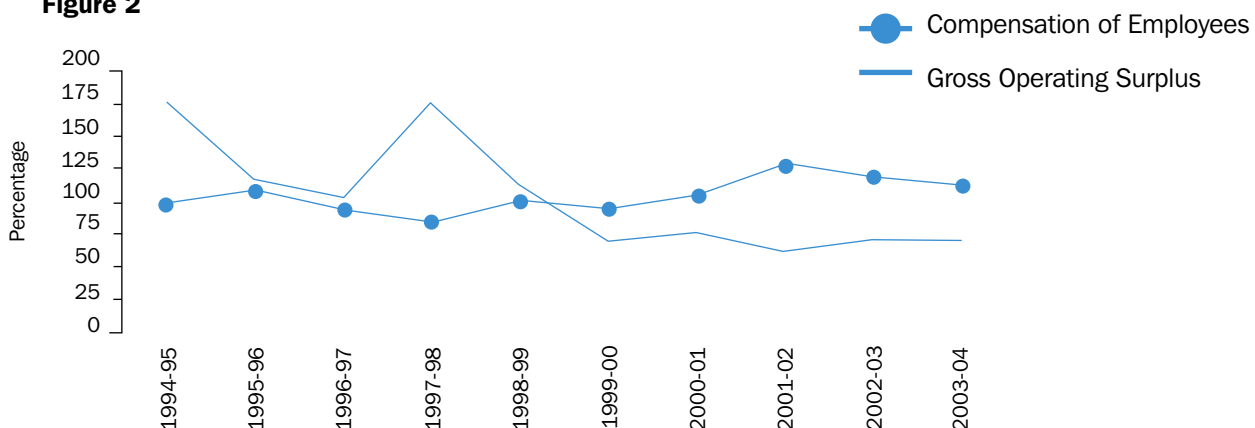
dimension of the cost of doing business and it is essential that growth in salaries is matched by increasing levels of profitability if business competitiveness is to be maintained. This article focuses on these aspects of competitiveness and examines the relative rates of growth in employment costs and profitability in Northern Ireland and compared to the UK as a whole.

POSITION RELATIVE TO THE UK

Examination of the changing position of the different components of GVA in terms of Northern Ireland's annual average growth rates relative to the respective UK averages (Figure 2) sheds light on the relative competitiveness of the local economy in this particular context. Obviously there are other aspects of business costs that are not considered here as the costs of other inputs such as goods and materials, energy and transport are already excluded by definition from the concept of GVA (see ERINI's "Measurement and Benchmarking of Competitiveness - the Cost of Doing Business in Northern Ireland" 2005 for a wider discussion). The latter report recognises

Northern Ireland annual growth rates as a % of UK average (Compensation of Employees and Gross Operating Surplus)

Figure 2



Source: ONS, DETI Statistics Research Branch

that Northern Ireland retains a competitive advantage over the other UK regions with regard to labour costs, but it is of interest to examine how this comparative advantage has changed in recent years relative to operating surpluses, against the UK position.

The Regional Accounts information indicates that Northern Ireland's annual growth in Compensation of Employees (COE) has outstripped the UK average with average annual growth over the last 5 years to 2004 equalling 6.1% compared to 5.6% for the UK. Indeed Northern Ireland had the highest annual average growth in COE of the UK regions in 2001-02 and 2002-03 and the 2nd highest in 2003-04. In contrast it has had the lowest rate of annual growth of Gross Operating Surplus (GOS) in 2001-02 and 2002-03 and the 4th lowest in 2003-04 of the UK regions.

This suggests that in the period 2000 to 2004 the annual growth rate in Northern Ireland employment costs has exceeded the UK average though since 2002-03 there has been some evidence of convergence in rates. Given that there has been scope for Northern Ireland salaries to improve to close the gap with the UK, particularly in the private sector, this is not in itself an undesirable outcome. NI COE might be expected to grow faster than in GB as the number of employees has grown faster. Equally GOS should grow faster for the same reason. However, over the same period, annual growth in Gross Operating Surplus has been just under 75% of the UK average, and in so far as this reflects a slower growth in profitability is less desirable.

SECTORAL CHANGES TO 2003

A more differentiated picture emerges when Northern Ireland's annual growth rates for the

two main components of GVA are compared at the sectoral level relative to the UK. Once again it is important to note that in absolute terms Northern Ireland private sector average gross weekly wages were lower than those for the UK as a whole for most sectors. Northern Ireland Manufacturing wages were 19.3% lower and only hotels and restaurants (+0.72%) and financial intermediation (+4.5%) reported higher earnings in Northern Ireland relative to the UK (when London and the South East are excluded) in 2004 (ERINI). However, in relative terms, there is some evidence of greater pressure on returns to businesses after 1999. Northern Ireland growth rates in operating surplus in the Manufacturing, Construction and Services sectors were slower than in the equivalent sectors in the UK from the late 1990s. By 2001-02 the growth in Northern Ireland operating surpluses in these sectors had fallen further behind the annual growth rate of the UK. In contrast, annual growth in Compensation of Employees had either tracked or exceeded the UK average in all three sectors (Figures 3,4,5)

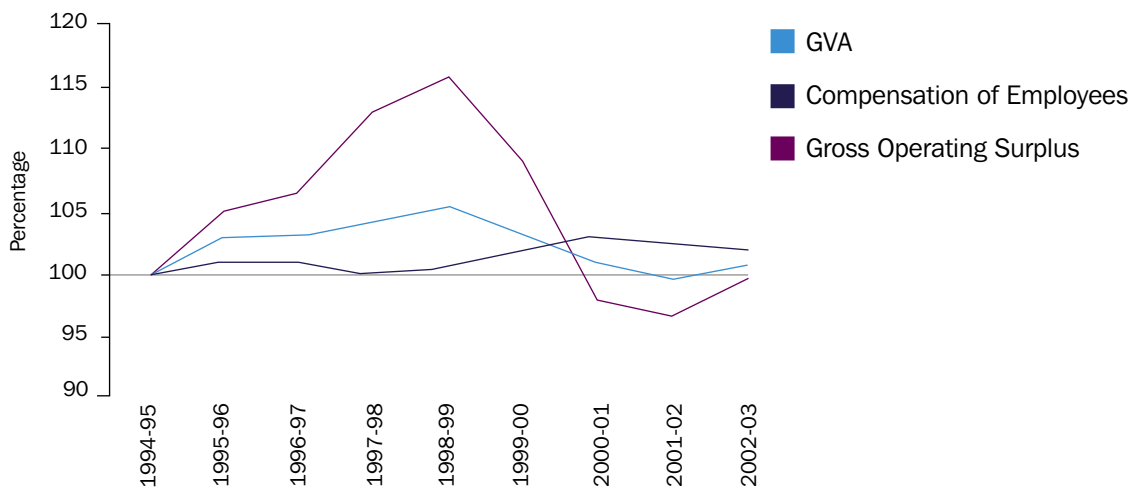
It is recognised that in general Manufacturing in Northern Ireland has proved successful in maintaining output and productivity levels (see also Article 8) despite falling employment in sectors such as textiles. However, there is evidence of a greater increase in the rate of growth of employment costs and a marked decline in growth of operating surpluses from 1998-2002 relative to the UK (Figure 3). A study commissioned by DETI on the "Future Role of Manufacturing in Northern Ireland" reported in 2005 that the growth in employment costs varies within the Manufacturing sector. In particular over the three year period to 2002 gross weekly wages have increased faster in those occupations concerned with basic manufacturing tasks than

in the skilled occupations. This may be one of many contributory factors and further analysis is required to assess the extent to which the effect occurs across manufacturing subsectors. However, the pressures on the rate of growth of operating surplus would appear to be sufficiently widespread to affect manufacturing as a whole and is broadly consistent with the slowdown in export growth in the period 1999-2003.

The relative decline in GOS was also noticeable in the service sector. Since 1993 there has been a decrease in employment costs in those sectors dominated by the public sector (public administration, health and education) but the fall in returns has been quite marked though there is evidence of improved performance in recent years. Measuring public sector output poses particular difficulties and estimating the value of activity in these sectors in a more appropriate manner has been the subject of the recent Atkinson review.

The private services' sector shows evidence of unfavourable changes in operating surpluses relative to the UK at the same time as a faster increase in employment costs (Figure 5). It is important to note that this discussion focuses on slowing rates of growth, not a decline in levels of operating surplus. For each of the main sectors it remains the case that overall growth in operating surpluses outstripped growth in employment costs up to 2000 when benchmarked against the position in 1993. It is the slowdown in annual growth rate relative to the UK that is less positive in recent years, which may carry an important message. While wages and salaries constitute the bulk of employer costs, there could also be pressures in other areas that are contributing to the pressure on profits. It is of course noteworthy that Northern Ireland industry is starting from a lower base in productivity terms relative to the UK and can ill afford to sustain a deterioration in its competitive position. ERINI's ongoing work

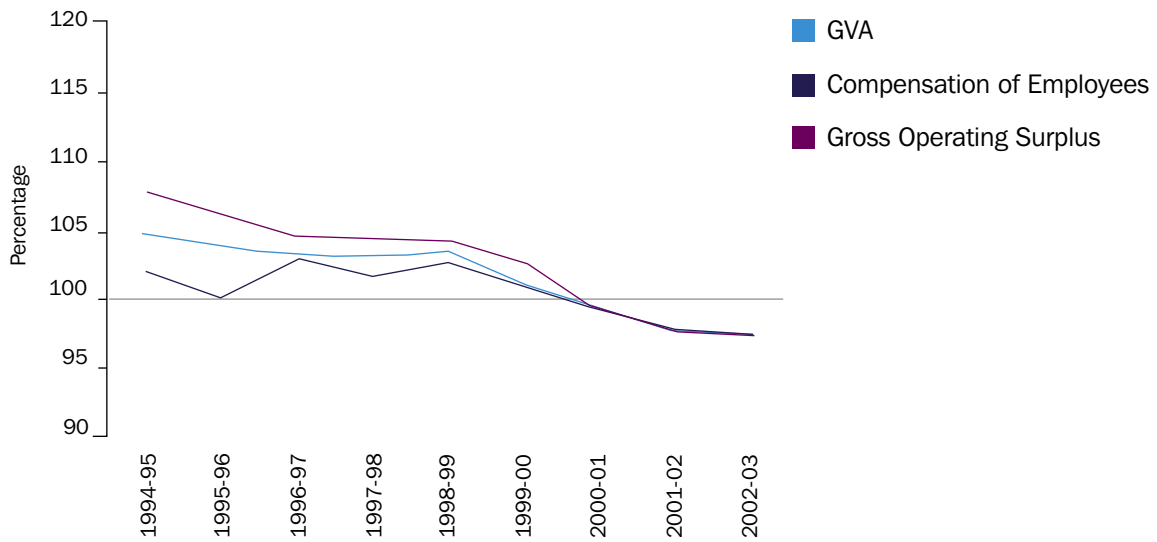
Northern Ireland annual Manufacturing growth as a % of UK annual Manufacturing growth
Figure 3



Source: ONS, DETI Statistics Research Branch

Northern Ireland annual Construction growth as % of UK annual Construction growth

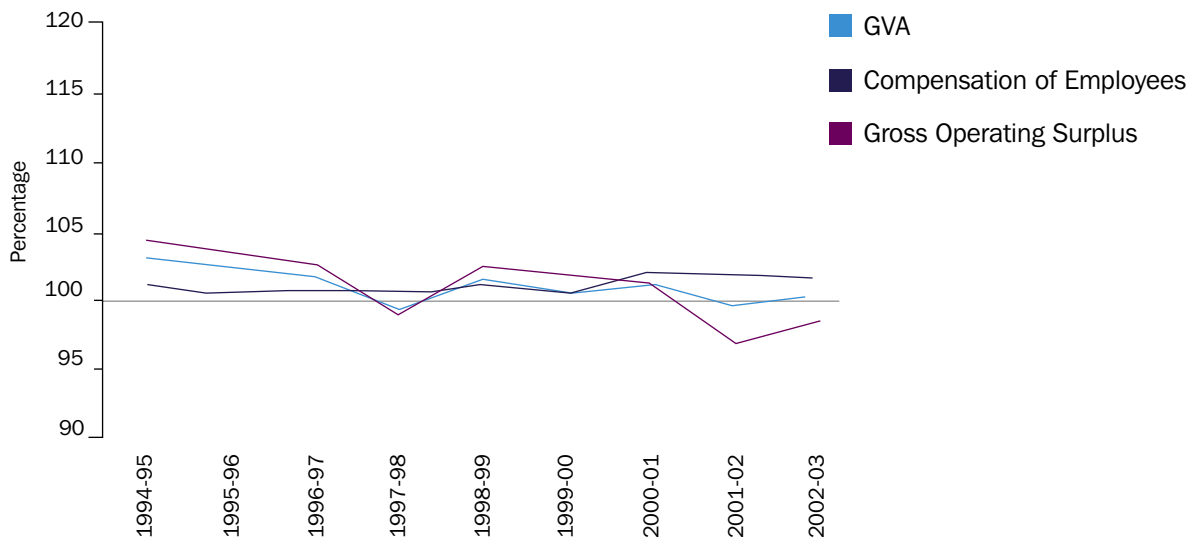
Figure 4



Source: ONS, DETI Statistics Research Branch

Northern Ireland annual Service Sector growth as % of UK annual Service Sector growth

Figure 5



on a competitiveness index for Northern Ireland is expected to shed more light on the relative contribution of different cost factors.

BROAD SECTORAL PERFORMANCE 2001 - 2005

To examine more recent performance at a detailed sectoral level it is necessary to consider results from short term survey measures of business employment and output. The latter do not allow examination of employment costs and operating surpluses being turnover or product based. They nevertheless provide a more up to date picture than available from Regional Accounts and provide a greater focus on the main sectors where growth has been occurring up to the 4th quarter of 2005. As can be seen in Table 3, the Production Industries in Northern Ireland have recorded a decline of 0.5% in real terms in the 4 year period to 2005, compared to a fall in output of 4.3% over the same period in the UK. Jobs fell by some 13.5% over the period suggesting net losses predominate at the lower end of the value added scale. Indeed, growth in Northern Ireland production (+0.4%) over the most recent year exceeded that of the UK where output fell by 1.9%. Output in the Construction industry declined by 8.9% in the period 2000-2004 while employee jobs increased by 4.4% (2001-2005). Growth continues to be strongest in private sector services where turnover increased by 8.8% over the 5 year period and employment growth was 10.4%³. However, the growth in services' output was lower than that recorded in the UK (12.1%) over the same period. It is noteworthy that Northern Ireland employment growth in the sector (private and public) (10.4%) was greater than that reported in the UK (6.4%) in 2001-2005. Article 8 confirms falling levels of output per hour worked in the service sector relative to the UK.

DETAILED PRODUCTION INDUSTRIES

PERFORMANCE 2001 - 2005

Over the period 2001-2005 there has been a decrease of 0.5% in the overall Northern Ireland index of production (IOP) (2001=100) in real terms. This compared with a decrease in output over the same period of 4.3% for the UK as a whole indicating the sector in Northern Ireland has fared relatively well (Figure 6). Regional accounts information at the sectoral level is only available to 2003 and the short term measure indicates that since then growth has been slowing with output having grown by 2.0% in 2002-03, 1.5% in 2003-04 and by 0.4% in 2005. Most of the main sectors comprising the index increased over the 4 year period with one notable exception - the textiles and leather sector, which declined over the period by 44.1%, which accounts for some 5% of the production industries. Nevertheless Northern Ireland continues to fare relatively better than the UK as a whole with growth in production above that of the UK since the third quarter of 2003.

A similar picture is evident for Manufacturing, the main component of the Production industries, with output having increased by 0.2% while jobs fell by around 14% in Northern Ireland (some 14,000 jobs) compared to a 2.4% decline in output and a 17% decline in UK Manufacturing jobs in the period 2001-2005. Growth has slowed since 2003 and was just 0.2% in real terms in 2004-05. Northern Ireland has been able to maintain growth in certain sectors while shedding jobs and the detailed nature of these changes is considered in Article 28 in this Bulletin which examines the role of Manufacturing in Northern Ireland.

Production, Services, Construction Output and employment for Northern Ireland and UK

Table 3

INDUSTRY SECTOR	NI % CHANGE IN OUTPUT ¹ 2001 - 2005	UK % CHANGE IN OUTPUT ¹ 2001 - 2005	NI % CHANGE IN EMPLOYEE JOBS ⁴ AT 2001-2005	UK % CHANGE IN EMPLOYEE JOBS ⁴ AT 2001-2005
Overall Production Industries	-0.5	-4.3	-13.5	-17.6
Mining and Quarrying	25.5	-20.9	10.3	-20.0
Manufacturing	0.2	-2.4	-14.0	-17.4
Electricity, Gas and Water	-8.2	1.6	-11.5	-23.6
All Services	8.8	12.1	10.4	6.4
Distribution, wholesale & Retail	14.8	14.5	8.6	2.4
Hotels and Restaurants	0.7	16.1	6.8	8.2
Transport Storage & Comm.	6.1	11.6	4.6	-0.1
Business Services & Finance	3.5	12.5	20.9	5.3
Other Services	19.8	N/A	9.5	10.4
Construction²	-8.9	15.3³	4.4	3.3

¹ Changes in output measured by IOP, IOS and IOC for NI and UK are at real prices - the NI IOS is not seasonally adjusted.

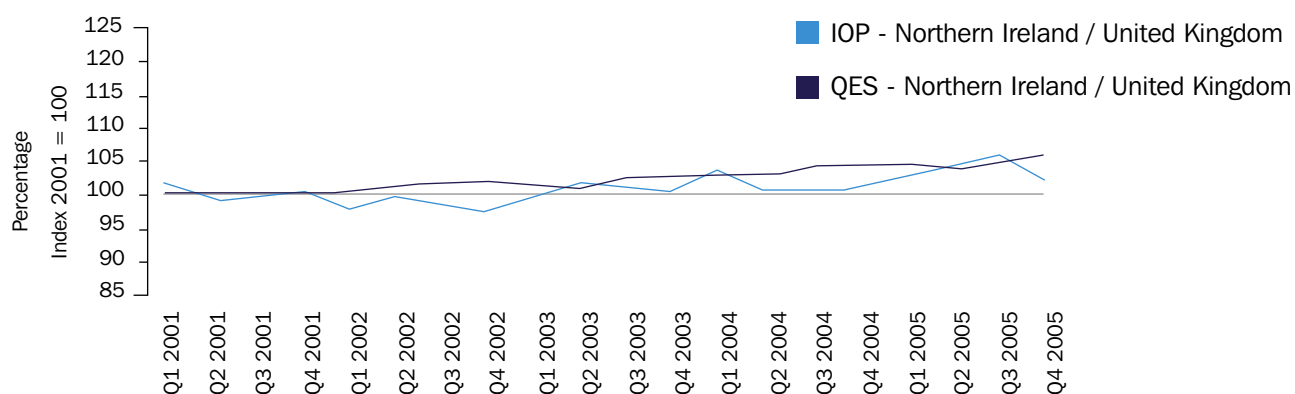
² The IOC figures measure the change between 2000 to 2004.

³ IOC figures are for Great Britain.

⁴ Employee jobs data cover both private and public sector jobs.

Production Industries, Output and Employees - Northern Ireland index as a percentage of UK indices

Figure 6



CONSTRUCTION SECTOR PERFORMANCE

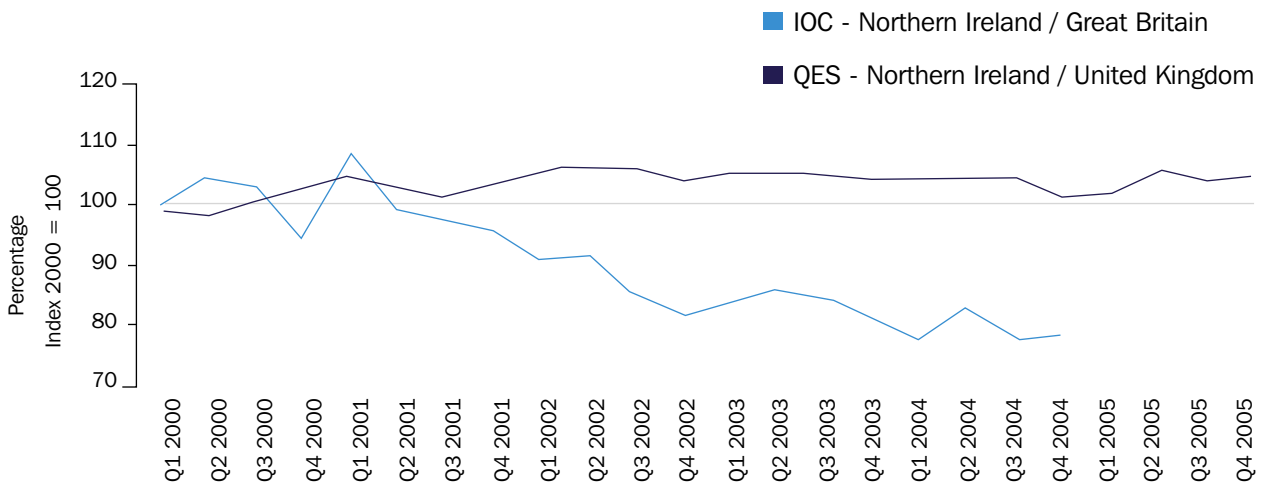
2000 - 04

In the period 2000 - 2004 the Index of Construction activity in Northern Ireland fell by 8.9%, this compared with growth in GB of 15.3% over the same period (Figure 7). The estimated value of construction output in GB has increased

by 4% per annum compared to a decrease of 2.3% per annum for Northern Ireland. The Northern Ireland Index of Construction expressed as a percentage of the GB index deviated above and below the GB=100 level up to Q2 2001, but has been below thereafter and was only 78% of the GB level in Q4 2004.

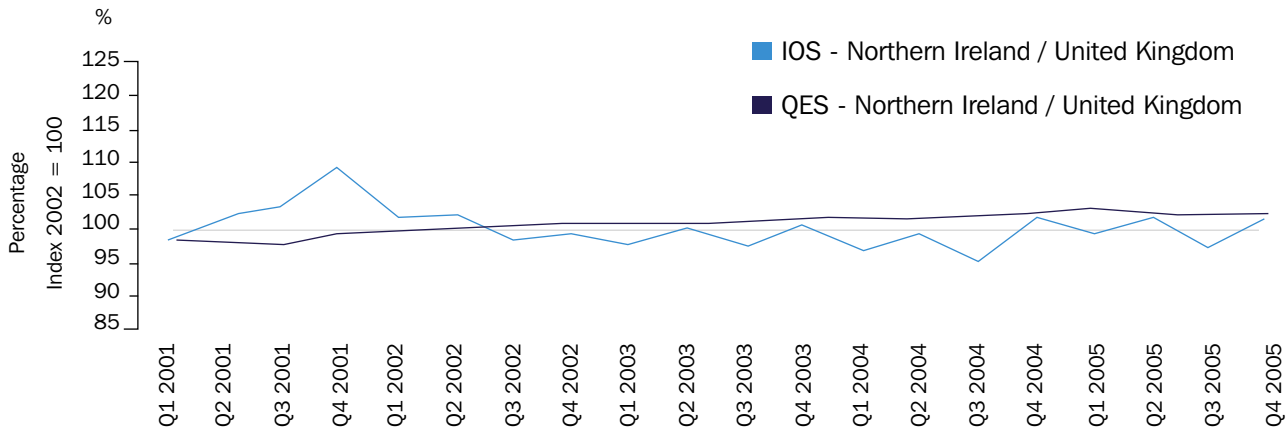
Construction Sector: Output and Employees, Northern Ireland index as percentage of GB/UK indices

Figure 7



Service Sector: Output and Employees, Northern Ireland as a percentage of UK indices

Figure 8



DETAILED SERVICE SECTOR PERFORMANCE 2001 - 2005

The (experimental) Northern Ireland Index of Services shows that the Service Sector average for 2005 has increased by an estimated 8.8% from 2001. This compares with an estimated increase of 12.1% for the UK as a whole over the same period reflecting slower growth in Northern Ireland relative to the UK since 2001 (Figure 8). Overall private service sector growth has gained in pace since 2003 with growth over the year of 2.8% in 2004 and 4.5% in 2005 compared to 3.5% and 2.7% respectively in the UK as a whole.

The overall increase in service sector activity in Northern Ireland since 2003 has mostly been driven by the performance of companies in the Business Services & Finance (accounting for 32% of the weight of the index), which increased by 8.8% compared to an increase in the UK of 7.7%.

Other key changes over this period (2003-2005) occurred in the Transport, Storage and Communication sector (+6.6% in Northern Ireland compared to +6.3% in the UK) and Other Services (+14.3% in Northern Ireland, no UK equivalent) sector which account for 13% and 9% respectively of the index.

The Hotels & Restaurants sector increased by 8.6% compared to an increase in the UK of 6.8%. However it should be noted that this sector accounts for just 6% of the weight of the overall

index and only includes those businesses whose predominant activity is hotels and restaurants.

The Distribution (Wholesale and Retail) Industry sector, increased by 4.9% from 2003 to 2005 compared to 5.9% for the UK and accounts for some 40% of the overall index.

However it should be noted that in the latest year this sector outperformed the UK equivalent with NI equivalent growth of 2.9% compared to 0.8% in the UK in 2004 - 2005.

CONCLUSION

While Northern Ireland continues to report ongoing jobs growth with private sector jobs growth continuing to outstrip those in the public sector, there is some evidence that there has been a slowdown in the growth rates of Gross Operating Surplus across the NI economy relative to the rates of growth experienced in the UK. It should be noted that this is at a whole economy level and the most recent year's data for the private sector (2002-03) shows that growth in employment costs have not continued to outstrip the rate of growth of operating surplus. Given that Northern Ireland's median private sector earnings are some 18% below those in GB this does not imply that employment costs are excessive in Northern Ireland. Rather it is clear that business profitability needs to be further optimised by increases in productivity (Article 2, 8 and 9) if Northern Ireland is to regain its fastest improving region status.

¹ The headline regional GVA series are calculated using a five period moving average.

² NI private sector median gross weekly salaries were £340 at April 2005 and GB private sector was £413.90 for employees an adult notes where pay was unaffected by absence.

³ Employee jobs data cover both private and public sector jobs.

Article 4: DETI's Policy Evaluation Process

Mike Maxwell - Policy Evaluation and Development Unit - Department of Enterprise,
Trade and Investment

INTRODUCTION

The DETI Corporate Plan for the period 2005-2008 reasserted the Department's commitment to building its policy-making capacity and capability on a sound evidence base, and on the results and recommendations of a focussed, high quality research and evaluation programme. The purpose of this article is to explain how the evaluation process works in theory within DETI, and provides an example of how it has actually worked in practice.

BACKGROUND

To be effective, policy-making must be a learning process which involves finding out from experience what works and what does not, and making sure that others can learn from it too. The key objective of evaluation is to understand whether a policy is achieving what it was intended to achieve, and whether the original rationale for the policy remains valid as circumstances in the economy change. Regular and systematic policy evaluation is therefore an integral part of the DETI 'policy cycle', and is essential, alongside a quality research agenda, in providing an evidence base to assess whether the Department's policies are relevant and effective. It is part of a loop that sees results and recommendations feed into policy development and implementation, and inform further research.

THE DETI POLICY EVALUATION PROCESS

Comprehensive evaluations are carried out on all significant DETI policies at regular intervals, either at a point in time when they are at the end of their life span, or have advanced to a predetermined degree. To be fully effective the evaluation includes an examination of the strategies (and programmes) which have been put in place to deliver the policy. Planning for the

evaluation phase is an integral part of the policy development process, thereby ensuring that the evaluation is conducted at the appropriate time, and that it provides essential feedback to prompt additional research and redesign of the policy where necessary.

HOW ARE EVALUATION PRIORITIES SET?

The Corporate Plan provides the strategic framework within which policy priorities are set, and policy evaluations taken forward. There is a two-tier hierarchy of evaluations, - higher and lower- broadly reflecting the hierarchy of plans and targets.

WHAT ARE THE HIGH LEVEL PRIORITIES?

At the strategic level evaluations are aligned to the four drivers of growth underpinning the Economic Vision - enterprise, innovation, skills and infrastructure. This ensures that a clear link is made between individual project or programme effectiveness, and the achievement of the Vision. All evaluations in this category are overseen by DETI's Strategic Policy Division (SPD), and are subject to the scrutiny of the Research and Evaluation Steering Group (RESG) and the Departmental Board (see below).

WHAT ARE THE LOWER LEVEL PRIORITIES?

At a lower (but not necessarily low) priority are those evaluations undertaken at the project or programme level, either by the Department, according to its priorities, or by its NDPBs according to their respective priorities. The majority of these evaluations are scrutinised by SPD and reported six monthly to the RESG.

RISK BASED PRIORITISATION

Policy evaluation contributes to the monitoring of progress against the Department's objectives; to

the effective development of future policy; and to the optimum allocation of resources at a strategic level. It is important therefore that the wider policy evaluation priorities are linked into the risk assessment process of the Department, with priority given to evaluation of policies identified as at risk of failing to make an effective contribution to the achievement of a corporate objective. In preparing the evaluation programme SPD examines the Departmental (and, where available, Agency) risk register(s), and focuses initially on those policies (and underpinning strategies and programmes) with a high or medium risk attached.

POLICY EVALUATION PROGRAMME

The yearly evaluation programme, which as indicated above, includes both high and low level evaluations, is assembled at the beginning of each financial year on the basis of an audit conducted by SPD's Policy Evaluation and Development Unit (PEDU) across the Department and its NDPBs. The yearly programme is submitted to both RESG and to the Departmental Board for approval. The programme is rolled forward on an annual basis.

POLICY EVALUATION PROTOCOL

A detailed policy evaluation protocol, specifying roles and responsibilities of the various interests in an evaluation, has been drawn up. The purpose of the protocol is to ensure that all of the appropriate interests - policy leads, Steering Groups, SPD, RESG and the Departmental Board - are familiar with the discrete elements of the evaluation process, thereby ensuring a holistic approach to the overall procedure. The following account of an actual evaluation details how the protocol works in practice.

POLICY EVALUATION PROCESS IN ACTION - START A BUSINESS PROGRAMME (SABP)

The Start a Business Programme, (and its predecessors), is the key programme within Northern Ireland aimed at providing support for potential entrepreneurs within Northern Ireland. It offers a core programme of support for all entrepreneurs, encompassing lead in assessment, training, business planning support and an initial start-up grant. The existing programme consists of:

- an initial interview to assess the business idea;
- a series of training modules on marketing, finance, legal matters, employment issues and ICT/computers;
- support with helping to develop a business plan;
- grant support; and
- a webpage/business logo design package.

The objectives of SABP have been endorsed within the wider Invest Northern Ireland Accelerating Entrepreneurship Strategy (AES), although the programme itself commenced two years prior to the launch of AES. SABP is the main volume intervention in Northern Ireland contributing to the AES strategic priority of "raising the level and quality of business starts". AES had been included as a high level evaluation in the 2005-08 DETI Evaluation Programme, but because of issues surrounding budgetary constraints on SABP it was decided that in the first instance the focus of the AES evaluation would be concentrated on SABP.

A Steering Group, under Invest Northern Ireland's chairmanship (but not the policy lead), and comprising representatives for Strategic Policy Division, DETI, DETI economists and the

Entrepreneurship Team within Invest Northern Ireland was established to oversee the project. Terms of reference for the evaluation were drawn up as follows:

- rationale (including market failure arguments);
- aims and objectives of the programme;
- achievements against targets;
- strategic context;
- effectiveness and efficiency measures;
- detailed analysis of programme, including:

- appropriateness of different elements of the programme
- levels of additionality and deadweight
- causes of attrition at various stages of the programme
- likely impact of applying selection criteria
- side and distributional effects, including equality/TSN impacts on voluntary activity and the voluntary sector;
- impact of the programme; and contribution of SABP to local economic development; and
- possible improvements to the programme (on assumption that continued funding is recommended).

Following an open-tendering process BDO Stoy Hayward were appointed as external evaluators of the programme.

The evaluation process commenced in November 2005 and involved close consultation with a number of delivery partners/key stakeholders. A considerable body of evidence was amassed, including:

- questionnaires completed by a randomly selected group (135) of those who had completed all elements of the programme;
- questionnaires completed by a small group

(30) of those who did not complete the full programme;

- analysis of the SABP database from enquiry through to start-up stage (40,000 entries);
- questionnaires completed by “top ten” SABP participants; and
- detailed benchmarking against similar programmes in GB.

On the basis of evidence gathered a number of initial findings emerged, including:

- the programme has had demonstrable economic impact, but the focus requires sharpening to minimise deadweight and ensure maximum value for money;
- there should be an ongoing commitment to volume start-up support;
- the “core” high volume programme should be delivered as efficiently as possible, using where appropriate online support;
- a more flexible “menu style” offering where individuals could pick and choose the elements they need would be preferable for clients and prove more efficient;
- while a core element should be maintained, resources should be skewed towards those with greatest growth potential;
- disadvantaged groups (ethnic minorities, women, younger and older people, people with disabilities, TSN etc) should be targeted for more intensive support;
- the capacity of the FE sector to bring specialist expertise to the programme should be explored; and
- any revised programme should add value to other initiatives being resourced by Invest Northern Ireland to promote business start ups.

A number of policy options were also identified,

including discontinuance of the programme; status quo; and a modified programme characterised by more flexibility and reflecting the findings of the research detailed above. Recommendations were also made on programme management, recording of the number of start-ups and programme mentoring.

A consultation process is now underway on the research findings and policy options. When this process is completed the evaluation protocol (see paragraph 9 above) will kick in again whereby;

- the lead policy Division within Invest Northern Ireland will consider consultation responses, sign off the project with the consultant; and produce a policy response/action plan (including ex-ante measurable outcomes) to the recommendations in the report, and submit this to the Steering Group;
- the Steering Group will agree the policy response/action plan and forward to Strategic Policy Division (SPD), DETI for approval;
- SPD will seek views, as appropriate, from a wider audience; finalise the policy response/action plan in the light of any comments; and return to policy lead Division within Invest Northern Ireland;
- Invest Northern Ireland will seek internal approvals, and return to SPD for onward transmission to RESG; and finally
- SPD will submit the policy response/action plan to the Departmental Board for approval.

Subject to the Board's comments the policy response/action plan will be implemented, and a report will be submitted to the Board every six months on progress against agreed actions. It is expected that the overall process will be completed by October 2006.

CONCLUSION

Effective policy evaluation forms an integral part of the Department's strategic management, policy-making and risk management processes, and provides an essential evidence base for the performance assessment of the Department. The advantages of a formalised system are clarity of purpose, uniformity, rigour of process and consistency of application. Against this, it is also important to maintain some flexibility in the process to take advantage of new developments, or the need to operate in a fluid policy environment.

Article 5: Northern Ireland Economic Development Forum - ‘Mind the Gap’

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INTRODUCTION

What is the Economic Development Forum (EDF)? Who are its members? How is it contributing to the development of economic policy? What is the gap? This article provides answers to these questions and, in particular, outlines how the Forum is trying to improve wider understanding of the factors that will drive economic success in Northern Ireland.

In March 1999, the Northern Ireland Economic Development Strategy Review Steering Group highlighted that Northern Ireland needed to develop a culture - in its businesses and wider society - of common commitment to economic success based on inclusive and effective partnership. One of the group's key recommendations was the establishment of an Economic Development Forum to bring together the social partners to agree on the development and implementation of economic development policy. It was also recommended that the Forum should be permanently established and chaired by the Economy Minister.

It was proposed that the Forum meet regularly, hold ad hoc meetings either on its own initiative or at the request of the Northern Ireland Administration and commission economic research and policy advice as appropriate. In particular, the Forum was asked to advise on issues relating to the development and future competitiveness of the Northern Ireland economy. In effect, to monitor the performance of the Northern Ireland economy against its competitors and advise on how to ‘mind’ the performance gaps between Northern Ireland and its international competitors.

The Forum was subsequently established and has held 27 plenary meetings to date. During this period, both within Northern Ireland and globally, the economic climate has changed significantly.

EDF has evolved as a result of these changes but has remained true to its original ethos that understanding and a consensus partnership approach to the key issues are fundamental if Northern Ireland is to realise its full economic potential. Some of the key economy issues discussed by the Forum since it was established include:

- Northern Ireland's medium term economic development priorities;
- the impact on Northern Ireland of Foot and Mouth disease outbreak;
- the establishment of Invest Northern Ireland;
- progress made by the taskforce on employability and long term unemployment;
- small business development in Northern Ireland;
- fiscal policy and incentives;
- the impact of the review of the EU's Common Agricultural Policy;
- the extent and impact of the shadow economy
- the impact of EU enlargement;
- the focussed assessment of the Regional Development Strategy;
- the work of the Strategic Investment Board
- public procurement; and
- the Economic Vision for Northern Ireland

A number of items have featured regularly on Forum agendas. These include the Assembly's programmes for government, the corporate and operating plans of key Government departments and economic research project priorities. The Forum has also discussed a number of key economy related strategies including:

- the Regional Transportation Strategy;
- the Regional Innovation Strategy (think|create|innovate);
- the Skills Strategy;

- the Unlocking Creativity Action plan
- the Strategic Energy Framework
- Further Education Means Business &
- the Regional Economic Strategy

FORUM MEMBERSHIP AND MEETINGS

Currently, the Forum consists of six representatives of business organisations¹, three representatives of the trades unions, two representatives of the voluntary and community sectors, one representative of the agriculture sector, two representatives of the Further and Higher education sectors and five Government departments. Full plenary meetings of the Forum meetings are chaired by the DETI Minister and are held quarterly. The Forum also has five working Sub-groups. Four of these are aligned to the productivity driver areas of the Economic Vision for Northern Ireland, Innovation, Enterprise, Skills, Infrastructure and the fifth, the Medium Term Strategic Priorities Sub-group (MTSPs), is responsible for monitoring the performance of the Northern Ireland economy and the Forum's communications strategy. Full details on the Forum, including the names and organisations of the current Forum members, are available on the Forum's website².

WORKING TOGETHER FOR A STRONGER ECONOMY

'Working Together for a Stronger Economy'³ is the Forum's seminal publication that presents the Forum's views on the approach required to address Northern Ireland's economic challenges. It contained a clear and agreed statement by the Forum on the key priorities that all sectors needed to address if the Northern Ireland economy was to be significantly strengthened by 2010. It also introduced a unique framework of key economic indicators against which progress could be monitored.

In particular, 'Working Together for a Stronger Economy' highlighted that the key to continued economic growth lies in raising productivity levels across all sectors of the economy. The document highlighted that this would involve addressing the low levels of innovation and enterprise that exist in Northern Ireland. It noted the economic importance of both an appropriately skilled labour force and a competitive physical infrastructure. It also recognised the need for Northern Ireland firms to be more aware of the opportunities offered by the modern global economy and to learn from international best practice.

Critically, the Forum recognised that a concerted effort by all parties, and on a variety of fronts, would be necessary if Northern Ireland is to realise its full economic potential. This would involve all sectors working together within an agreed framework and towards commonly agreed aims and objectives.

In order to define what economic success for Northern Ireland by 2010 might look like, the Forum developed its monitoring framework, which was not developed in isolation. Forum members were keen to build on previous analysis of the Northern Ireland economy and took account of the main themes emerging from a number of key sources including the Strategy 2010 report, the Northern Ireland Assembly's Enterprise Trade and Investment Committee's response to Strategy 2010, the Executive's Programme for Government and other existing economic research material⁴.

'Working Together for a Stronger Economy' was an important developmental step in establishing the Forum's partnership approach to economic development issues and provided for the first time a shared vision of what economic success for

Northern Ireland should look like.

It also established a fundamental principle that actions must be focused on the key priority areas and monitored to assure appropriateness. The seven key priority areas identified as needing action were as follows:

- Knowledge / Productivity Growth
- Innovation and Creativity
- Enterprise
- Outward Looking
- Equality of Opportunity / Social Inclusion
- Human Capital - enhancing capabilities and skills
- Competitive Physical Infrastructure

Each of these priority areas had an overall objective, a series of performance indicators, associated targets and was directly linked to a series of supporting actions by key contributors. When the document was launched, on 20 June 2002, the main 2010 targets were identified as follows:

- Increase manufacturing and private services productivity to close to or above UK levels;
- Increase R & D Expenditure per employee to UK levels;
- Increase the Northern Ireland business birth rate closer to the UK level;
- Exports to grow to UK levels (per employee) and tourism numbers to double;
- Lower longer-term unemployment to UK levels;
- Raise the skill levels of the Northern Ireland workforce and in particular raise levels of essential skills; and
- Raise broadband access to 10% of Invest Northern Ireland client companies by 2005.

Members also highlighted that through the Forum, and its framework, Northern Ireland now had, for the

first time, a single point of reference, within which all sectors could operate and work in partnership to strengthen the Northern Ireland economy.

FIRST REVIEW STATEMENT

When the Forum published 'Working Together for a Stronger Economy', it gave a commitment to regularly review progress and, in January 2004, the Forum published its first review of progress towards the 2010 targets it had identified. This review highlighted that the review process would be repeated at regular intervals and that performance, good and bad, would be assessed and changes to the framework made as necessary. Specifically, the first review took stock of changes in the economic environment, locally and globally, and examined progress, positive and negative, against the targets set.

The most positive aspects of the review were that employment levels were continuing to rise, earnings were on the increase and Northern Ireland was catching up with the UK in terms of some skill levels. On a much less positive note, the review statement also highlighted that much more needed to be done if the Forum's vision of a significantly strengthened Northern Ireland economy by the year 2010 was to be achieved. The Forum's key areas of concern were as follows:

PRODUCTIVITY

The Forum's review reported that in 2003 Northern Ireland manufacturing productivity was 97% of the UK average and private sector services productivity was just 85% of the UK average. It was highlighted Northern Ireland had historically low productivity by UK and EU standards and that research had attributed this to Northern Ireland's industrial mix, which was dominated by a relatively high concentration of traditional, low-productivity sectors.

The Forum's conclusion was that productivity across the Northern Ireland economy needed to be increased if wages and living standards gaps in Northern Ireland were to be closed. In specific relation to the manufacturing sector, the Forum noted that, if the Northern Ireland manufacturing sector was to operate at world-class standards, much greater emphasis was needed on product and process development and on attracting high value added sectors to invest in Northern Ireland.

MANUFACTURING

The headline figure in the Forum's review was that manufacturing exports in 2002/03 had declined marginally from the previous year. This was the second year in a row that manufacturing exports had declined and the Forum highlighted the strong pound and depressed demand in the Euro area prevailing at that time may have been a factor. However, the Forum's main focus was that the human cost of the decline in Northern Ireland's traditional industries could not be ignored and that more needed to be done to prevent further job losses or, where these become inevitable, to better prepare employees in such sectors to cope with the transition. In particular, the Forum highlighted that, with increased competition from China and India, Northern Ireland would no longer be able to compete for manufacturing jobs in terms of cost and needed to shift the focus to quality and attract higher value-added jobs.

BUSINESS RESEARCH AND DEVELOPMENT

The review statement noted that business expenditure on research and development (BERD) had declined by 1.7%, in real terms, between 2001 and 2002, compared to a UK increase of 3.3%. In particular, the Forum highlighted the proportion of plants involved in product and process innovation declined from 58% to 54% and 50% respectively.

In its analysis, the Forum concluded that a 'one size fits all' policy, in terms of providing incentives to encourage greater investment by businesses on R&D, would merely reinforce the existing distorted pattern of R&D spending between the UK regions and that there was a strong case for the introduction of Northern Ireland specific R&D tax incentives. The review also highlighted that the Forum had commissioned research aimed at securing the necessary evidence to support a case for an enhanced R&D tax credit for Northern Ireland.

BUSINESS START UPS

The Forum reported that Northern Ireland's start-up rate, per 10,000 of the business population, in 2002, was 62% of the comparable UK figure and, although this was an improvement on the base year, the Forum was concerned about the size of the gap and the rate with which it was being closed.

In its analysis, the Forum noted the low level of business start-ups was one of the key weaknesses of the Northern Ireland economy and that it was essential to create in Northern Ireland a culture and environment which supports and encourages enterprise and entrepreneurial activity. It was also noted that efforts to encourage entrepreneurship must begin in the education system, so that all learners, from primary school pupils through to university students and life-long learners, are given the opportunity to develop the skills and attributes necessary to enable them to make a unique, innovative and creative contribution in the world of work, regardless of their career choice.

The Forum concluded that the successful implementation of the Accelerating Entrepreneurship Strategy (AES), launched by Invest Northern Ireland in June 2003, would be key to addressing this concern and it noted it would watch developments with interest.

During 2005, DETI and Invest Northern Ireland commenced an evaluation of the components of the AES and members of EDF have continued to show their keen interest. The Forum's Enterprise Sub-group has been involved in shaping the terms of reference of the Start a Business Programme evaluation and, along with other key stakeholders, is being consulted on the draft report of the evaluation.

ENERGY COSTS

In the review, the Forum noted electricity costs in Northern Ireland, in 2003, were 30% to 70% higher than in GB. The Forum welcomed the high priority being given by Government to examining the options for reducing the cost of electricity in the then draft energy strategy, but noted that while the investment proposed would have a significant impact, Northern Ireland businesses would still not be operating on a level playing field with the rest of the UK, or RoI, in terms of electricity costs and more needed to be done to close this gap.

The Forum concluded that it fully supported the ongoing collaborative efforts between Northern Ireland and RoI to develop an all-island energy market and that it was looking to this to deliver increased reliability / security of supply; lower costs; and greater choice for all Northern Ireland consumers.

ECONOMIC DEVELOPMENT FORUM'S (EDF'S) REVISED MONITORING FRAMEWORK AND THE ECONOMIC VISION FOR NORTHERN IRELAND

In August 2003, Regional Forecasts Ltd (RFL) were commissioned to undertake a project aimed at improving understanding of the Forum's framework of indicators and targets, first published in 'Working Together for a Stronger Economy'. The research had a number of distinct aims:

- To investigate the viability of the targets;
- To investigate potential linkages and interactions between individual targets;
- To relate the targets to the wider economic environment; and develop a forecasting methodology to provide 'leading' evidence of the projected path of the target variables; and
- To provide recommendations to DETI both with respect to the targets themselves and the potential role of government in supporting progress towards the targets.

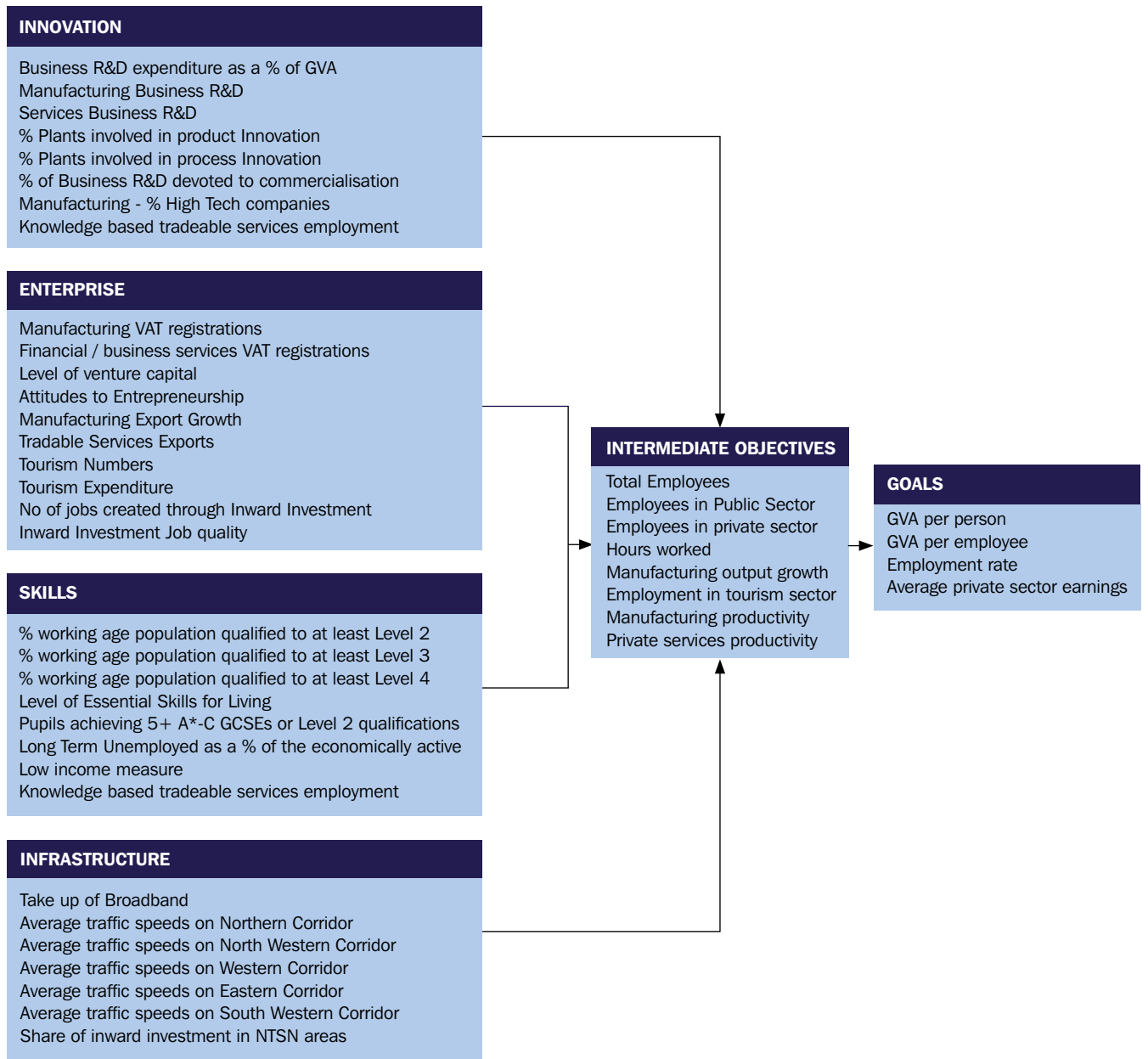
This research revealed a number of fundamental concerns over the long term robustness of the framework, not least that there would be a problem maintaining the consistency of the dataset over time. The research also revealed a number of practical and applicability concerns about some of the indicators chosen⁵.

Following discussion with EDF, RFL presented a revised framework consisting of a hierarchy of goals, intermediate objectives and drivers for change. The key feature of the revised framework was that the hierarchy aimed to distinguish between those drivers which can be influenced by policy (against which targets might be set), and higher-level goals and intermediate objectives that it may not be possible to specifically target but which progress could be monitored. The revised framework was agreed by the Forum at its meeting in September 2004.

In parallel, work had also commenced to develop an Economic Vision for Northern Ireland (the Vision). The Forum supported the need for the Vision and recognised that it had a key role to play in ensuring efforts to achieve the 'Vision' maintain momentum and remain on track. In particular, the draft 'Vision' document highlighted that the Forum's

EDF Vision Monitoring Framework

Figure 1



ongoing work on its Medium Term Strategic Priorities monitoring framework would provide a greater understanding and insight and help the local economy respond more quickly to sudden changes in the global economy.

In February 2005, the Forum met with representatives of the local political parties, to discuss and progress the 'Vision' and there was a collective commitment that all sectors should hold each other to account in tracking the progress of the 'Vision'. The main outcome of this meeting was the establishment of four 'Vision' Sub-groups⁶, aligned to the four productivity driver areas of the 'Vision', innovation, enterprise, skills and infrastructure. A secondary outcome was that the Forum decided to refine its monitoring framework further to align it with the 'Goals and Drivers of the Vision'. This re-alignment was completed in autumn 2005 the current structure of the framework is detailed in Figure 1.

This 'Vision' framework addresses all of the shortcomings of the original MTSPs framework. In particular, the overall structure has been simplified by reducing unnecessary duplication of indicators and data sources have been tested to ensure their long-term integrity and viability. The proposed hierarchy clearly highlights the linkages between productivity drivers, which can be influenced by policy, intermediate objectives and higher-level goals.

The framework has also been a catalyst for the development of the Northern Ireland Policy Simulation model and, in addition to its use for tracking the implementation of the Economic Vision, the framework can produce forecasts for most indicators. This forecasting ability means the framework can be used to model the impact of

policy interventions or used as an early warning system to show when trends are moving in the wrong direction.

CONCLUSION

This article has established the background to the Economic Development Forum, described its membership and meetings, outlined what it has discussed and highlighted how the Forum is contributing to the development of economic policy. In particular, the article has demonstrated the role the Forum has played in improving wider understanding of the factors that will drive economic success in Northern Ireland and helped clarify just what economic success for Northern Ireland should look like. In effect, identifying and minding the gaps be they in productivity, economic activity, wages, innovation, enterprise, skills or infrastructure.

The article has also shown that, through informed discussion, Forum members, who represent a broad range of interests, can reach a consensus position on key issues and challenges facing the Northern Ireland economy. Furthermore, by providing pragmatic advice, EDF has helped to shape the development of key policies on competitiveness, innovation, enterprise, skills and infrastructure.

In 2006, the Forum will publish a review and monitoring statement which will provide evidence on the progress the Northern Ireland economy is making towards the goals detailed in the 'Vision' Monitoring Framework.

¹ EDF's Business representative organisations - Confederation of British Industry; Institute of Directors; Northern Ireland Chamber of Commerce and Industry; Londonderry Chamber of Commerce and Industry; Federation of Small Businesses & Centre for Competitiveness.

² www.edfni.com

³ Working Together for a Stronger Economy is available for download from the EDF website www.edfni.com.

⁴ NIEC statement on "The Capabilities and Innovations Perspective: the Way Ahead for Northern Ireland" by Michael H Best.

⁵ Regional Forecasts Limited, Comparative Analysis, Forecasts and Monitoring of the Northern Ireland Economy Report 1: Initial Monitoring (November 2003).

⁶ The scope of this article does not extend to the work of EDF's Vision Sub-groups. Dates and Minutes of EDF's Vision Sub-groups can be accessed from the EDF website www.edfni.com.